ENGINEERING NEWS-RECORD

Plastic Roof Is Cast on the Job p. 63

A McGRAW-HILL PUBLICATION

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HOW CAN I MAKE MORE MONEY ON ASPHALT JOBS OVER 30 OR 40 MILES AWAY?

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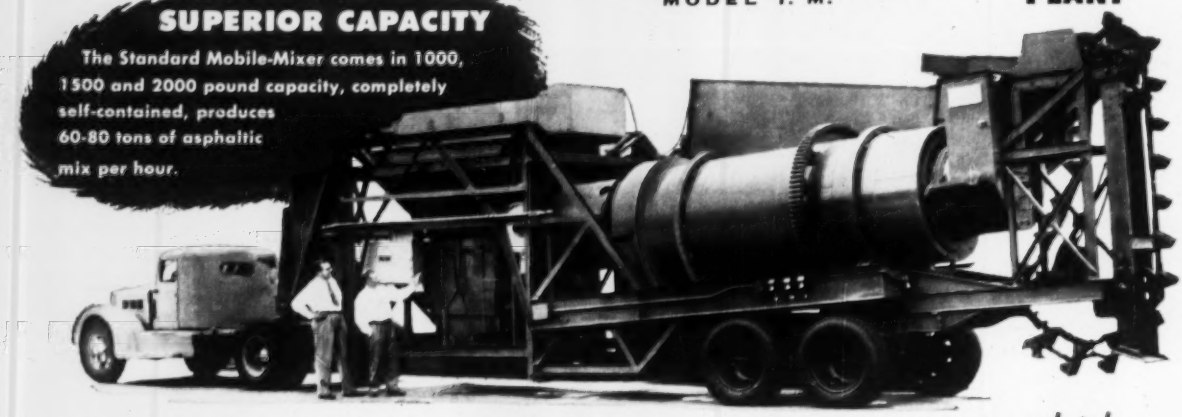
The Standard Mobile-Mixer comes in 1000, 1500 and 2000 pound capacity, completely self-contained, produces 60-80 tons of asphaltic mix per hour.



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- *Same ruggedness as on Standard's larger Model R-M Plants.*
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- *Extra strength in all working parts, for greatest dependability.*
- *No bottlenecks, balanced throughout.*

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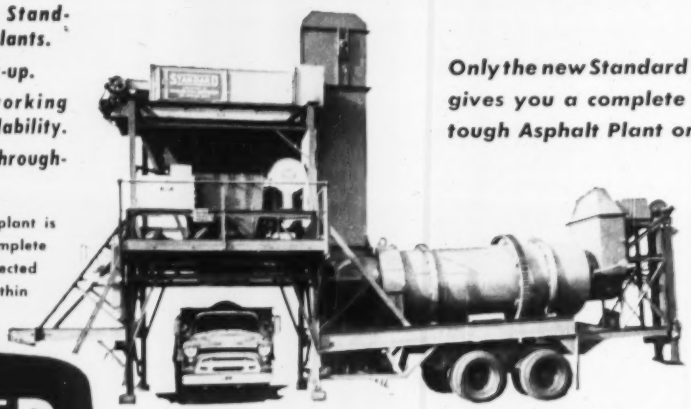

Only the new Standard T.M. Mobile-Mixer gives you a complete batch-type really tough Asphalt Plant on wheels.

NO WASTED ASSEMBLY TIME!... Exclusive self-erecting device raises or lowers in 30 minutes!

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STANDARD STEEL CORPORATION

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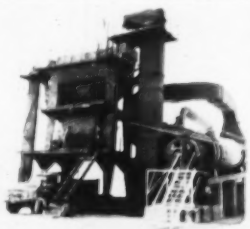
Standard's portable asphalt plants provide the same experienced engineering and dependability as found in Standard's larger semi-portable Model R-M asphalt plants. Both are backed by 55 years of development, knowledge and experience. Write us for the complete story; also the address of a Standard plant located near you. A personal visit to that plant can be your best investment.

STANDARD Model R-M ASPHALT PLANTS



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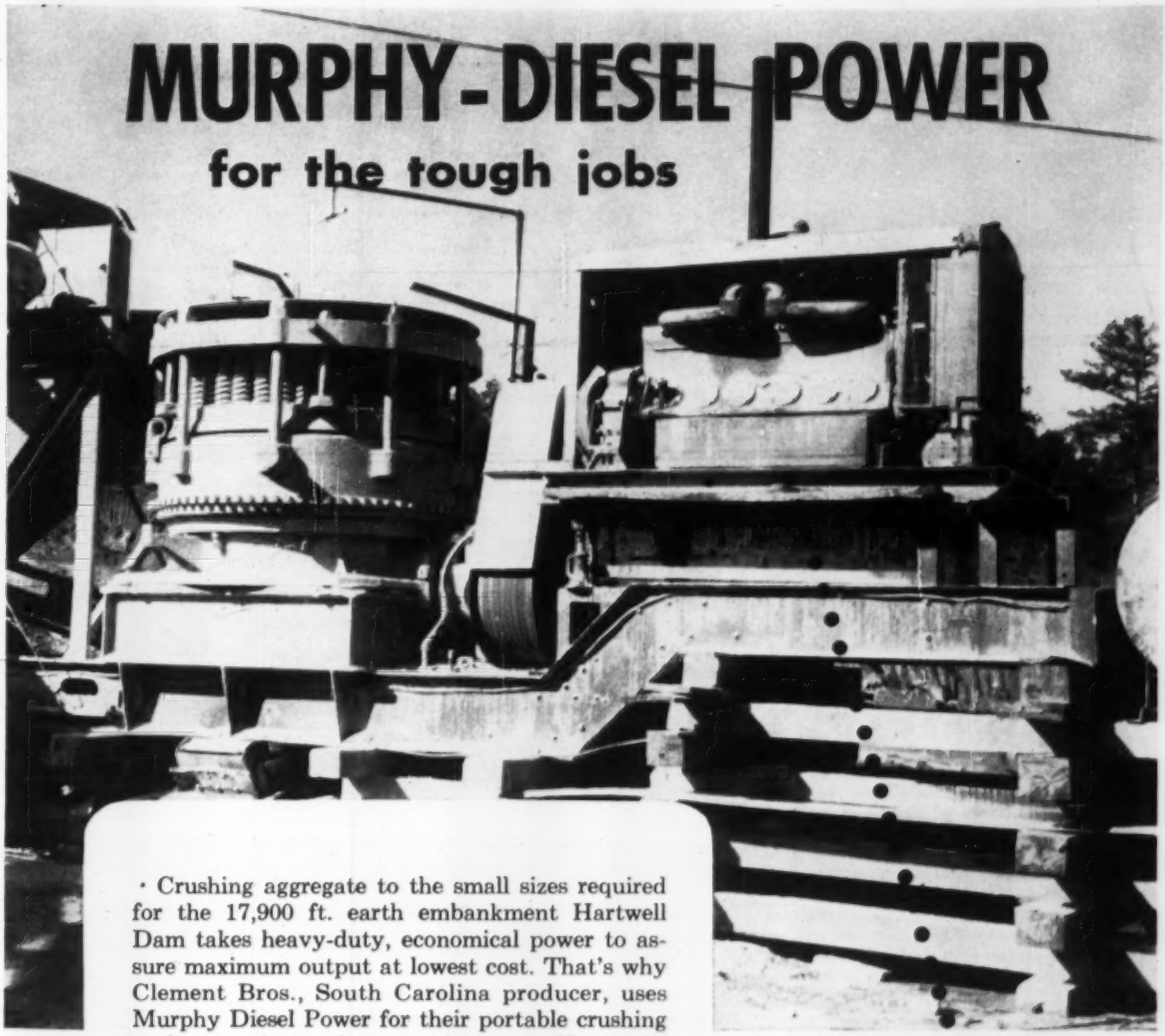
for the tough jobs



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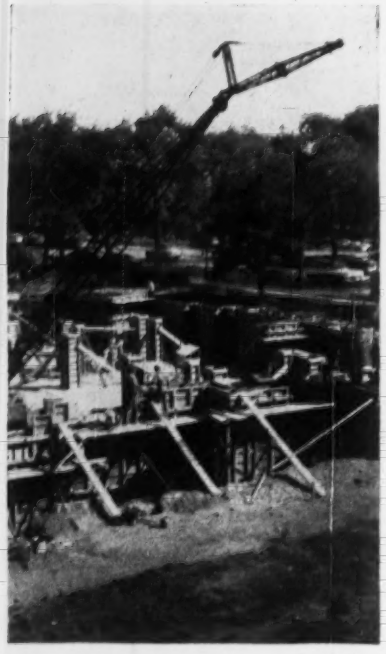

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17,500 square feet of Symons Forms with steel cross members were used to form curved walls, large pilasters and stepped footings on the new addition to St. Scholastica School in Chicago. Walls varied in thickness from 18 to 20 inches and in height from 9 to 10 feet. During one shift, from 8:00 a.m. to 4:30 p.m., the contractor was able to pour 200 yards of concrete. Overall size of the project is 190 x 190 and estimated cost is in excess of $1,000,000.

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EIGHTY-THIRD YEAR OF PUBLICATION

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The Northwest Dual Independent Crowd that utilizes force most independent crowd shovels waste, the "Feather-Touch" Clutch Control, the Cushion Clutch, Northwest design and construction and other Northwest features all combine to give high output in tough digging.—And, if you have a *real* Rock Shovel you never have to worry about output in *any kind* of digging.

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ASK A TEXACO LUBRICATION ENGINEER to help you simplify your lubrication and reduce your costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

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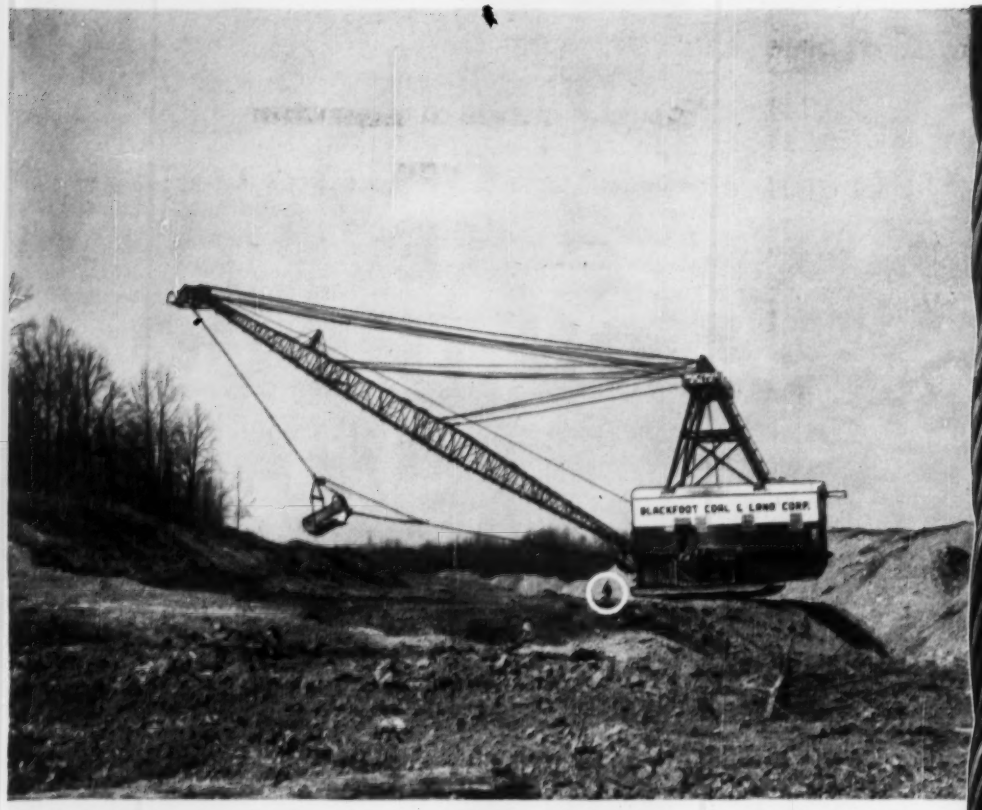
FOR ALL CONTRACTORS' EQUIPMENT



LAY-SET VHS

15% Stronger • Tougher • More Wear-Resistant

50% Longer Life from VHS Dragline

. . . at Blackfoot Coal and Land

• Mr. Henry Fitch, Superintendent of Blackfoot Coal and Land Corporation, Oakland City, Ind., says: "The two ropes on our Bucyrus-Erie 500W Dragline normally lasted only from 1½ to 2 months—even though we used the best Improved Plow Steel lines we could get. We were pleasantly surprised when our first VHS line lasted over 3 months—an increase in service life of well over 50%. Naturally, we are using VHS from now on out."

New Grade of Steel

VHS is setting service records like this on draglines, shovel hoist ropes, and scraper cables all over the country. Made from a new grade of steel for wire rope, it is at least 15% stronger than IPS—the strongest grade formerly available. This means you can handle heavier loads with the same diameter line. And you get a higher factor of safety.

Cuts "Down Time"—Saves Money

New VHS is not only stronger, it is tougher, too. It resists abrasion . . . keeps its shape under pressure . . . can't become "hidebound" or lose its flexibility. It lasts longer in the toughest applications . . . such as draglines, shovel hoist ropes, and scraper cables.

The longer life you get with VHS saves you money. And you make more big savings by cutting "down time" of equipment for wire rope replacement.

At Your Distributor Now

Your distributor has scraper cables, draglines, and shovel hoist ropes of new LAY-SET VHS in stock now. Just call him and tell him the size and diameter you want. You don't need any complicated specifications.

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18 EARTH-MOVERS MOVE 1,400,000 YARDS IN 90 DAYS—

CUT SCHEDULED TIME IN HALF!

▲ One of "the earth-movin'est earth-movers around," Holloway Construction Co., Livonia, Mich., proved it again when grading for relocation of U. S. 16 at Brighton, Mich. Work started 12 days after job was let – and 6 miles of sand, clay and muck up to 40 feet deep were hustled as never before. Tires shown are Goodyear TUBELESS Sure-Grip Lug – built with triple-tempered TRIPLE-TOUGH 3-T NYLON Cord.

▲ GOODYEAR BIG TIRE SERVICE at Holloway's U. S. 23 relocation job at Fenton, Mich. Strategically located, well-equipped, well-manned service like this cuts down time to a minimum wherever Goodyear helps jobs roll. Tire shown is Goodyear TUBELESS again!

80% CUT in earth-mover tire down time!

*That just **begins** your savings with 3-T Nylon Cord*

TUBELESS TIRES!

ON JOB AFTER JOB, contractors agree that tube and flap troubles cause up to 80% of tire down time. End tubes and flaps and those troubles end, too—and you also save on tube replacement and inventories.

You save time mounting—you save extra valve parts—you save on maintenance, for with Goodyear TUBELESS many repairs may be made *without removing tires!*

YOU SAVE TIRES, TOO—for with Goodyear TUBELESS, small injuries usually show *before* they get serious.

So be sure you specify Goodyear 3-T Nylon Cord TUBELESS tires on all new equipment—and see your Goodyear dealer for change-over of present vehicles. Goodyear, Truck Tire Dept., Akron 16, Ohio.

Buy and Specify

GOODYEAR

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

All-Weather, Road Lug, Sure-Grip—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

NOW TUBELESS OR TUBE-TYPE
WITH 3-T NYLON CORD!

SURE-GRIP LUG

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ROAD LUG

GOODYEAR TIRES

Look for this nearby Goodyear dealer sign for better tire values—better tire care.

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It's not enough when laying concrete to have the proper cement-sand-aggregate-water mixture. As important for achieving maximum hardness and strength are proper curing, the prevention of too fast a moisture loss and complete protection against weather during the critical setting stage.

That's where Durethene® polyethylene film fits into your road building program. Durethene film is a superior vapor barrier that stops downward moisture loss. And it's an ideal "curing blanket" for preventing too rapid an evaporation loss after pouring. It's a low cost, reuseable covering to protect fresh concrete from sudden showers. It's easy to handle—1000 sq. ft. of 4 mil film weighs less than 20 lbs.

Check Durethene polyethylene film today. See how this rot-proof, moisture-proof, acid and alkali resistant film can save you time, money and labor, as well as result in a superior concrete for road building. Also, check its use for temporary shelters, lightweight, low cost tarpaulins and water-proof equipment covers.

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D-9

Reader Comment

Obituary Error

SIR—Please refer to page 89 of your issue of May 23, 1957, "Obituaries".

While I deeply appreciate mention in your valued publication, I am much surprised that an item of this nature could be misplaced in a section so widely and carefully read by members of the engineering profession.

Since I am still very much among the living, and have every hope of remaining so for some time, I would greatly appreciate your taking such action as you see fit to correct any impressions to the contrary.

G. W. MILLER
Chief Engineering Assistant
Corps of Engineers
Memphis, Tenn.

EDITOR'S NOTE—To paraphrase Mark Twain, the implied report of Mr. Miller's demise "has been greatly exaggerated". As can be seen from the letter above, he is still very much alive and kicking, and, we trust, is continuing the superior performance for which he was cited by the Defense Department.

Seaway Excavation Costs

SIR—I read with great interest your article and editorial on excavation at the St. Lawrence project (ENR June 13, pp. 31, 192).

Whenever the contractors claims for additional payment for excavation are settled, we will know the full story about bid prices on excavation. Until then both sides will be reluctant to give detailed information.

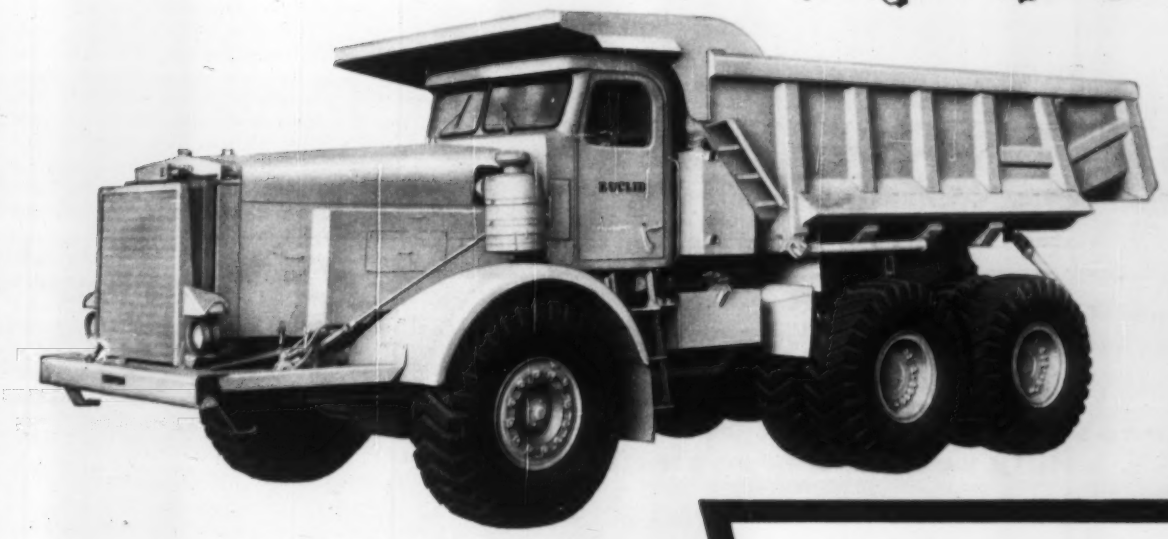
At present you may be able to review the soil profiles in the contract drawings for all projects. If the description of soil therein had been mentioned in your article we might already find a clue as to differences in bid prices.

Your remark that "they (the contractors) could have read it in the text books" (the geology and soil mechanics of the area) is incorrect in regard to one large project I know of—maybe for more than one!

On the foundation exploration draw-

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Now MOVE 40 TON LOADS AT LOWEST COST WITH THIS Euclid *R-40*



TWIN-POWER REAR-DUMP

This model R-40 is the newest addition to Euclid's complete line of Rear-Dump haulers. Built for jobs where big loads must be hauled, it incorporates all of the advance design features that have made "Eucs" the standard of performance for hauling heavy excavation in construction, mine, quarry and industrial service.

Two power trains—each with separate engine, 3-speed Torqmatic Drive and planetary drive axle—provide plenty of power to move capacity loads over tough haul roads and steep grades. The tandem axles are spring mounted to permit fast travel on good haul roads . . . the R-40 has a top speed of 26 mph with full payload.

Hydraulic booster steering makes this big Euclid easy to handle in close quarters and on tough hauls. Dumping angle of 67° and smooth interior of exhaust heated body assure quick, clean shedding of the load into hoppers, over the bank, or on the fill.

Your Euclid dealer will be glad to discuss the model R-40 and your off-highway hauling problems. He'll provide a production-cost estimate for present or planned operations, and can show you why ***Euclids are your best investment.***

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

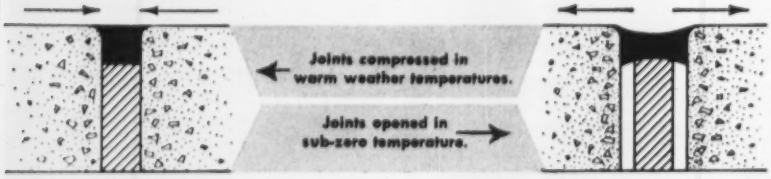
Special Joint Sealing Compounds

resist damage caused by

Aircraft Fuel Spillage

keeps joints in airport concrete safely sealed under all conditions

The deteriorating effect of aircraft fuel and other petroleum solvents which come in contact with ordinary joint sealing material used on concrete runways, aprons and taxi strips, causes serious pavement damage and expensive maintenance. Once the seal of an expansion, contraction or dummy joint is broken the infiltration of water and foreign materials into the joint begins the damaging action which results in ultimate pavement failure.



The development of two special sealing materials—Hot Poured Para-Plastic® JF and Cold Applied Zero-Lastic® JF—which are impervious to petroleum solvents and are unaffected by extremes of temperature, has eliminated the damage caused by spillage of jet fuel and other petroleum solvents.

Both materials form a resilient and adhesive seal which maintains bond with the concrete at sub-zero temperatures. Their stability is constant and they will not become soft and fluid during high summer temperatures. (See drawings above.)

Hot Poured, Para-Plastic JF and the cold applied Zero-Lastic JF are widely used, not only in new construction, but in maintenance of old concrete pavement as well. Both compounds can be pumped into the joint with readily available equipment. Hot Poured Para-Plastic JF meets Federal Spec. SS-S-167, and Cold Applied Zero-Lastic meets Federal Spec. SS-S-170.

For more details on Hot Poured Para-Plastic JF and Cold Applied Zero-Lastic JF, write the manufacturer:

SERVICISED PRODUCTS CORPORATION • 6051 West 65th Street • Chicago 38, Illinois

. . . Reader Comment

ings for this project the overburden is described as "sand and gravel" on two out of every three borings, sometimes as "apparently fairly compact sand and gravel." Every third boring indicates clay or silt, but described as "sand, gravel and clay" or "silty sand and gravel." The expressions "glacial till" or "marine clay" are not mentioned. Reading this description you don't anticipate that you would have to blast the overburden, as the contractor did.

Contractors who submitted their bids on this information were taken by surprise when they prepared their bids for the Canadian projects on the St. Lawrence some weeks later. In the contract drawings there, they found exact descriptions of soils with reported tests indicating that the removal of overburden would be one of the most costly ever encountered by the bidders.

It would be interesting to read a comparison of soil investigations made and information given to contractors prior to the bidding for the different agencies on both sides of the border.

KLAUS THIEME
NEW YORK, N. Y.

SIR—Your account of excavation costs on the St. Lawrence Seaway is about as misleading as the original description in the bidding data.

The "Gentleman" never came close to making any money and was very lucky to get away from the area with the very few remaining bolts that were left.

It seems to me that this subject, where so many good construction men have been completely wrong, requires a complete study by your people. I will be looking forward to seeing a better story with less questions and more facts.

ROGERS BADGETT, PRESIDENT
Badgett Mine Stripping Corp.
Madisonville, Ky.

[**Editor's Note:** We share Mr. Badgett's desire to see published the whole story on what Seaway excavation really cost. But for now, the questions were best we could do. Answers must await settlement of claims he and his confreres, the contractors, have against the St. Lawrence Seaway Development Corp. and its construction agent, the Corps of Engineers.]

Fire vs New Buildings

SIR—The article, "Bad Design Blamed for Fire Loss," and editorial, "Design Against Fire Spread," (ENR May 2, p. 69 and p. 132) concerning the National Fire Protection Association's analysis of the record-breaking 430

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THE new Ingersoll-Rand CRAWL-IR is the most completely mechanized, self-propelled crawler drill ever developed. Boom swing, boom lift, tower tilt, tower swing and tower lift are all hydraulically controlled at the touch of a throttle, permitting faster, easier and safer setups for drilling in any position. And because it tows its own air compressor, even up grades and over rough terrain, you don't have to take other equipment off the job for this purpose.

Teamed up with a Gyro-Flo 600-cfm, it gives you a drilling combination that has no equal for economy and dependability of operation. The famous Gyro-Flo rotary action, thoroughly proved by more than six years of on-the-job service, is your best assurance of low-cost, virtually maintenance-free air power. Ask your IR Distributor or representative for complete information on this pace-setting drilling team.

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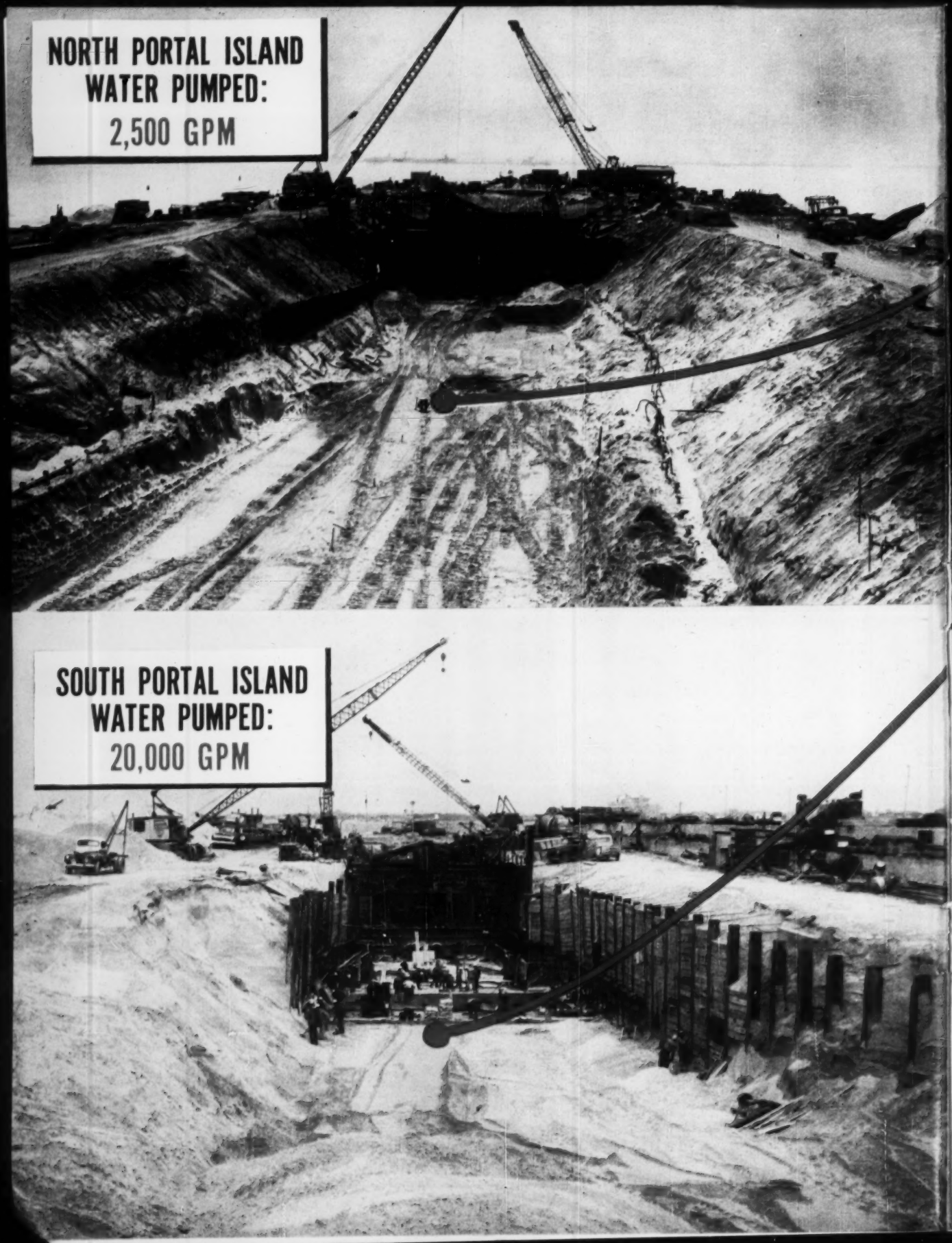
THE BEST AIR EQUIPMENT FOR BETTER HIGHWAYS


NORTH PORTAL ISLAND
WATER PUMPED:
2,500 GPM
SOUTH PORTAL ISLAND
WATER PUMPED:
20,000 GPM

Contractor: Tidewater Construction Corporation, Norfolk, Va.
Engineers: Parsons, Brinckerhoff, Hall & Macdonald, New York
Owners: Department of Highways, Commonwealth of Virginia

MORETRENCH WELLPOINTS

Make it Possible to Dig Deep and Dry in the Middle of Hampton Roads

On each of the man-made islands pictured here a deep excavation is being made in the dry for the north and south approaches to the vehicular tunnel which the state of Virginia is constructing under Hampton Roads, between Hampton and Norfolk. Bridges connect the islands to the mainland. The tunnel, running between the islands, will be one and one-half miles long.

Moretrench wellpoint systems keep 38' of water under control while excavation proceeds rapidly, economically, and safely.

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. . . Reader Comment

large-loss fires in the U. S. and Canada in 1956, command the serious attention of all architects and engineers in the building industry.

The problem of designing economical buildings that will adequately resist and control fires is a real and ever-present challenge. However, it occurs to the writer that ENR and the NFPA report may, by implication, be unjustly criticizing the designers of today's buildings. I strongly suspect that a great majority of the large-loss fires included in the NFPA report involved old structures, which were designed in bygone days when fire-protection technology was not as advanced and widely accepted as now.

If this is a valid opinion, would it not be appropriate to recognize the progress that has been made and present a more forward-looking appraisal of today's designers with respect to the design of fire-resistive buildings?

WILBUR H. SANDERS
Alexandria, Va.

[EDITOR'S NOTE—The following is an answer to Mr. Sanders' letter from the NFPA.]

SIR—The record of last year's large-loss fires does not substantiate Mr. Sanders' opinion that modern buildings are not as vulnerable to disastrous fires as the old-time buildings. It is true that more old buildings than those of recent vintage are represented in the large-loss record, but I am inclined to believe that this is due primarily to the relative numbers of "old" and "new" buildings rather than to any notable increase in the degree of fire resistance of buildings built in recent years.

There is a large volume of evidence in the record of last year's large-loss fires as published in the April, 1957, NFPA QUARTERLY to substantiate this conclusion. It may be sufficient to call attention to the six supermarket fires that involved losses in excess of $250,000. These were modern buildings. Yet because of fire protection weaknesses in their design, they experienced disastrous fires.

CHESTER I. BABCOCK,
Manager
Fire Record Dept.
National Fire Protection Assn.
Boston, Mass.

CALENDAR

World Conference on Prestressed Concrete, Fairmont Hotel, San Francisco, Calif., July 29-August 2.

Hydraulics Div., American Society of Civil Engineers, Kresge Auditorium, Massachusetts Institute of Technology, Cambridge, Mass., Aug. 26-28.

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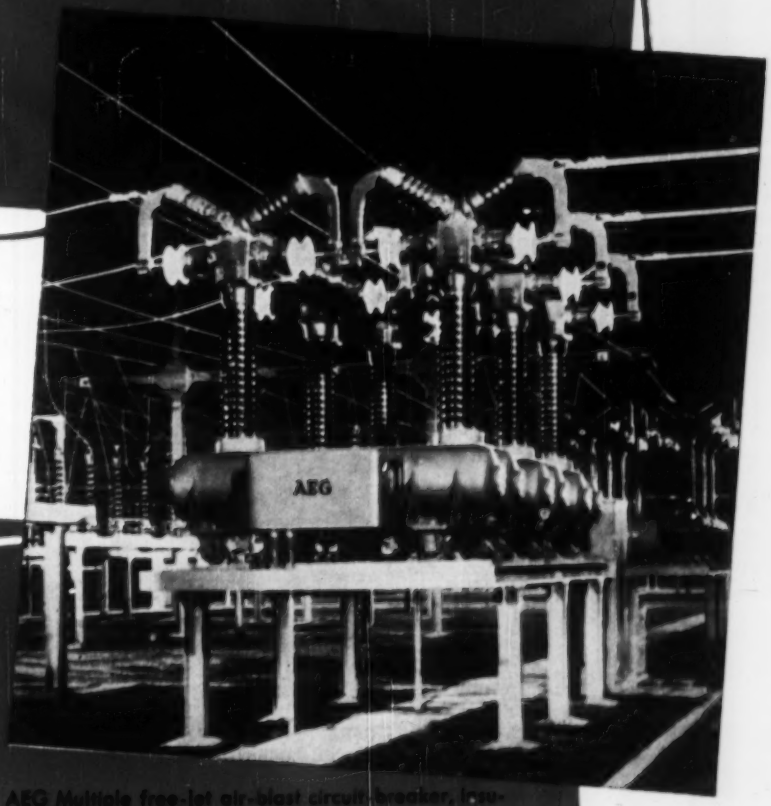

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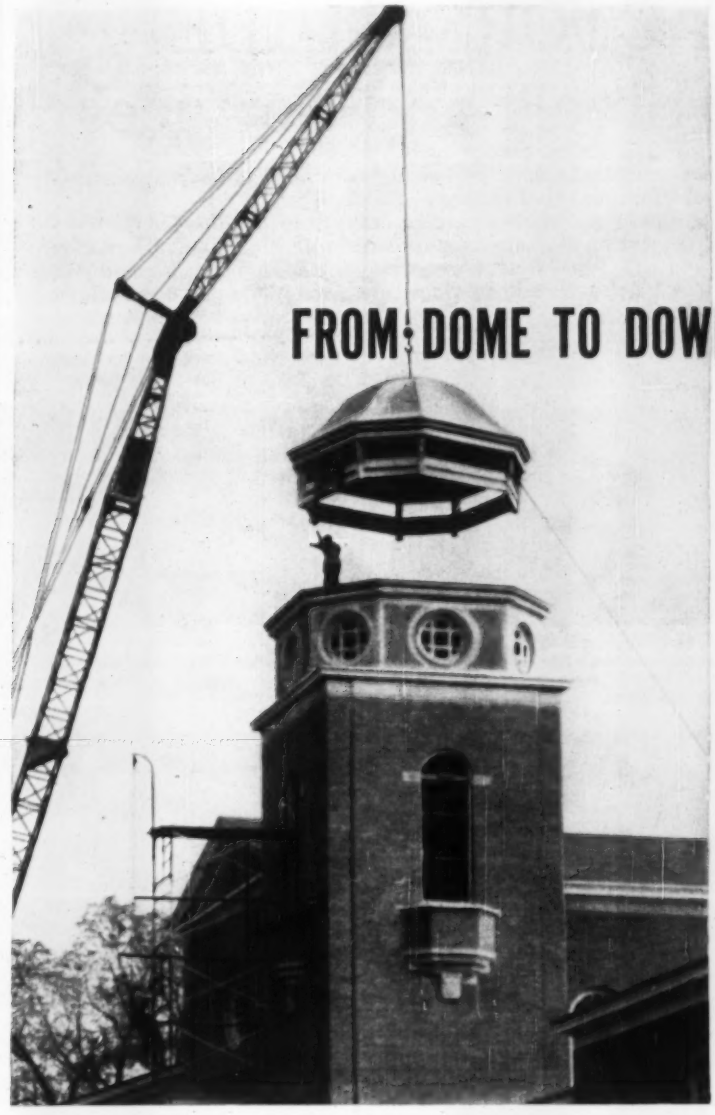

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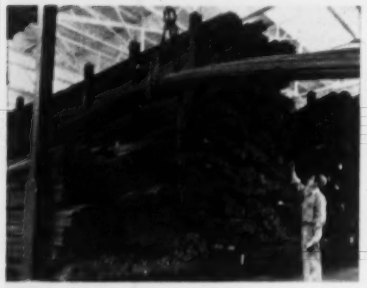
CONTRACTORS GUIDE to Ryerson Steels and Services

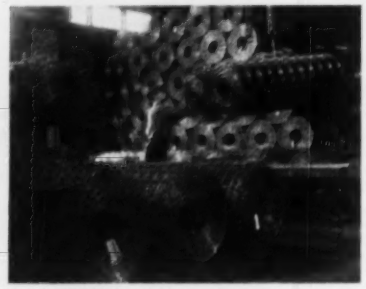
Supply problems are delaying many construction projects today, but you can keep jobs moving ahead unhampered by steel shortages when you build with reinforced concrete—and depend on Ryerson reinforcing service.

So for your buying convenience here's a quick review of Ryerson steel products—all in good supply—and Ryerson services for contractors—all readily available to you.

See your Ryerson Steels catalog for the complete list of products—including all construction steel accessories, threaded bars, turnbuckles, caisson rings, etc., and write for our bulletin (No. 70-2) on specialized reinforcing service.



RE-BARS—New-billet, deformed reinforcing bars in stock at 15 Ryerson plants. Designed for highest bonding power, bars conform to all building codes and to ASTM specs. A-15-52T and A-305-50T.



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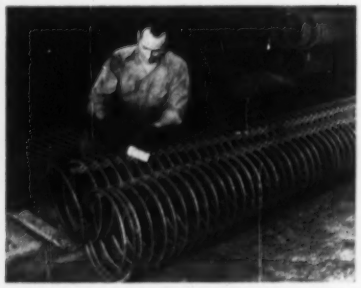

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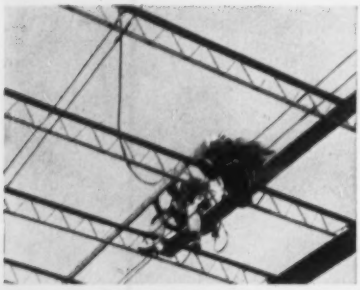

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CONTENTS

NATIONAL AFFAIRS

Interstate Highway Net—On Schedule 23
Warped Concrete Shell to Roof Store 25
Asphalt Due Back for Jet Field Paving 26
Package-Type Steel Hangar for Jet Age 27
Report Blames Design for Roof Failure 28
Missouri Water Storage Sets Record 29
ASCE Survey Shows Salaries Up 30

FEATURES

A National Jamboree Is More Than Tents 32
Unique Interchange to Speed New Orleans Traffic 38
Texas Water Story: Lessons for All 47
Drill Rig Sets Up Quick Channel Blasts 55
Reinforced Plastic Roof Is Cast at Site 63
Pittsburgh's Traffic Bottlenecks Begin to Break ... 64

RESEARCH

New Autos Pose Road-Designing Problems 73

INTERNATIONAL

Singapore's Progressive Public Housing 78
France Adds Two Reactors to Nuclear Power Center 82

MEN AND JOBS

Kansas University Names New Engineering Dean 84

NEW PRODUCTS

Air Conditioner Fits All Convector Heating Units . 87
Architect-Engineer Scales Available on Flat Plates 87
Stroke Pump Adjustable While in Operation 87
Vortex Desanding System Is Unveiled 88
Foamed Concrete Made by Adding Aluminum .. 90

BUSINESS AND FINANCE

Cement Strike Decreases Stocks 134
Arkansas Faces Money Squeeze 134
Cost Engineers to Set Estimating Standards 137
Construction Market: San Francisco 138
Construction Bills Delayed in Delaware 140
Illinois Votes Money for Schools, Roads 142
Industrial Project on Detroit's Drawing Boards ... 142

LABOR

New Jurisdictional Peace Plan 145
Hot-Cargo Ban Valid 146
Protests Against New Reactor Renewed 146
Beck Precedent May Apply to Hutcheson 146
Strikes Continue on Both Coasts 148

Reader Comment 8
Calendar 14
Washington Observer 21
Obituaries 94
Legal 97
Unit Prices 103
Materials Prices 104
Construction Reports 108
Scoreboard 132
Editorials 160

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THE CONSTRUCTION WEEK

"EXCESSIVE . . . BEYOND DOUBT"—The Corps of Engineers, which had rejected all bids for construction of Eagle Gorge Dam on the Green River, southwest of Seattle, has now rejected a formal protest by the low bidder on adequacy of its estimate. Low bid of $10.9 million by Peter Kiewit Sons Co. exceeded the government estimate by $4 million. Col. R. J. Page, Seattle District Engineer, recommended the rejection, finding that while a "moderate revision" of the estimate could be supported, the low bid was "excessive . . . beyond doubt."

SPARK OF GENIUS—Frank Lloyd Wright's spiral-ramp Guggenheim museum will have an unanticipated new-type exterior wall as a result of a suggestion made by the old master to the general contractor. This was disclosed to the Concrete Industry Board of New York City during an inspection by its members of the unusual concrete building. Trouble was being experienced in fabricating a copper facing called for in Mr. Wright's plans and he was asked for additional information. He recommended that the copper be sprayed on the concrete wall. The contractor followed up on this idea, found an interested metalworking company and as a result precast panels sprayed with molten copper will be used on the building.

WORLD CONSTRUCTION YEAR—Plans are being laid for a construction counterpart of the International Geophysical Year, which started July 1 (ENR June 13, p. 192). Proposed initially by Dean H. B. Gotaas of Northwestern University, the World Construction Year, with international cooperation, would be held in 1960, followed by a World Construction Congress in 1961. Two other cooperating sponsors have already been lined up—the American Society of Civil Engineers and the American Institute of Architects.

HAPPY BIRTHDAY—The American Society of Agricultural Engineers, celebrating its 50th anniversary, took stock of the $30 billion industry that is agriculture. It is mechanized, with $4 billion a year going into its equipment. It is modernized, with $27.5 billion annually going into new farm building construction, including houses. And it is undermanned, with only one engineer per 1,500 farm workers—a proportion that existed in some manufacturing industries 100 years ago. ASAE sees a bright future in intensified mechanization of farming, with 85% of farm problems involving engineering applications.

BIG PLUM—The 46 elevators (38 operatorless) and 10 moving stairs in the 60 story central office building under construction for Chase Manhattan Bank in New York City represent the largest elevator contract ever awarded. It went to Otis Elevator Co. Bank officials will not reveal the amount of the contract.

HOW TO PICK SCREENS *that pay profits*

Screening aggregates is a tough job—but it can be done efficiently and at low cost—with Telsmith Vibrating Screens. This new Telsmith bulletin tells you how. It explains which type of screen is best for scalping . . . sizing . . . washing—and why Telsmith builds two types of four bearing screens and one type of two bearing screen. It describes each type; shows several new Telsmith Vibro-King features, including—new counterweight mechanism and new spring suspension, making it the smoothest and most efficient screen you can buy, either for scalping or finishing. Shows new heavy-duty tray construction; best methods for mounting screen cloth. Full of helpful pictures, diagrams and specifications.

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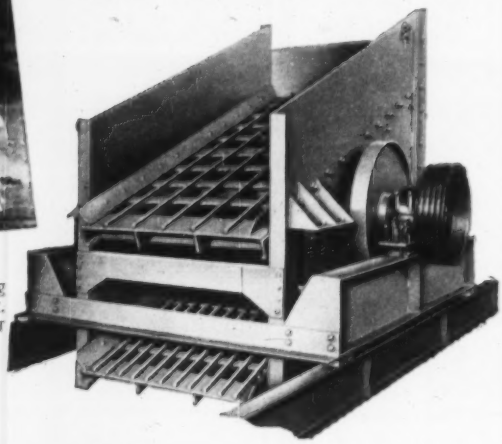
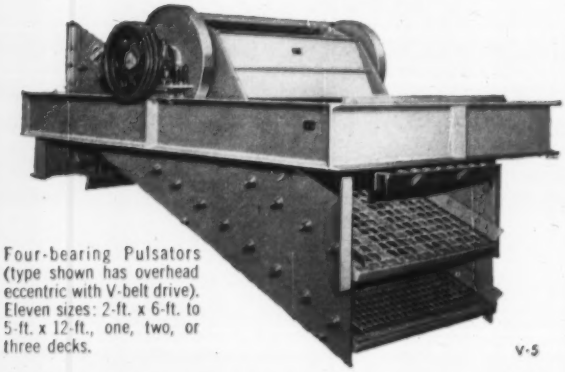


Heavy-Duty four bearing Scalpers—seven sizes: 3-ft. x 6-ft. to 5-ft. x 14-ft., one or two decks.

Two-bearing Vibro-King Screens—eleven sizes: 3-ft. x 6-ft. to 5-ft. x 16-ft., one, two, or three decks.



Four-bearing Pulsators (type shown has overhead eccentric with V-belt drive). Eleven sizes: 2-ft. x 6-ft. to 5-ft. x 12-ft., one, two, or three decks.

V-5

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WASHINGTON OBSERVER

- Tallamy switches on "no raiding"
- Steel, cement prices under fire
- Too much plant construction?

- **Bureau of Public Roads has backed away from the "no raiding" clause** designed to prevent consulting engineers from hiring personnel, from any and all highway agencies after getting a contract.

  Back in January, BPR recommended such a provision for all contracts on federal-aid highway work. State highway departments wanted it, but wanted Washington to take the responsibility. However, engineers reacted violently, claiming it was "job freezing." So the bureau stalled, saying it would "clarify" the clause, but not rescind it.

  Now, highway chief Tallamy has officially withdrawn BPR backing in a circular memo to the states, leaving them to work out their own personnel protective devices with the consultants they hire.

  Most if not all the 48 states are expected to keep some protective clause. They like the idea of protecting themselves from "pirating"—at least from pirating by the firms they engage.

  Bureau division engineers may have a say in the situation. Mr. Tallamy points out that they have to determine whether or not a consulting firm has the manpower to handle a contract. The implied threat is that firms looking to state agencies for their engineers might not qualify.

—

- **Price rises in steel, cement and other construction materials** are going to be given the full treatment by Senator Kefauver's anti-trust and monopoly subcommittee.

  Senator Kefauver and his group suspect big producers set prices unfairly —and they cite the recent steel price increase as an example. The target of the committee's hearing which got under way this week is "administered pricing"—which is defined as pricing that doesn't respond readily to the ups and downs of supply and demand. In steel, Senator Kefauver will try to show that the price rise doesn't stem from competition, but from the price leadership of a few large steel firms.

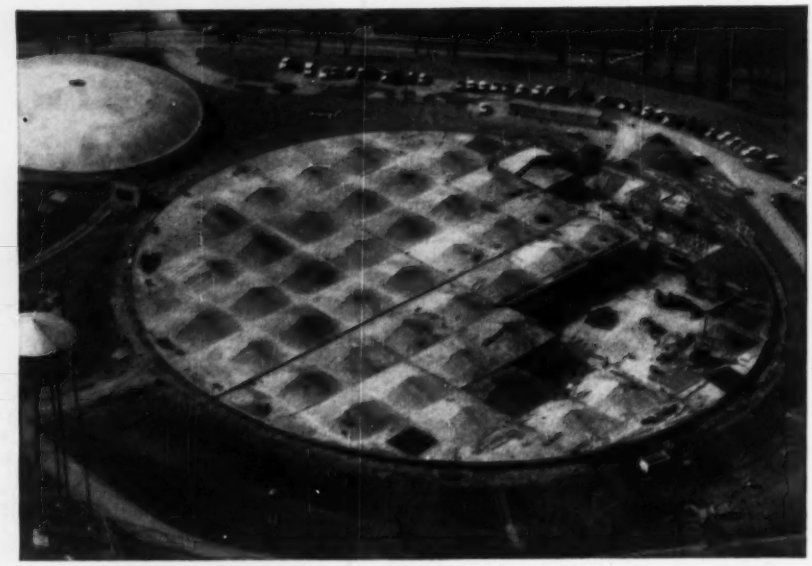
  The steel price situation has been brought up by Senator Gore in the Senate Finance Committee's look-see into the Administration's tight money policies. Senator Gore says that with money so hard to come by, companies raise prices to provide the cash for expansion. This shows, according to Senator Gore, that the tight money policy with its high interest rates isn't an effective way to fight inflation.

—

- **A new Congressional report questions whether the seeds of a new depression** are being planted by too rapid construction of new capacity in some industries. The question is asked by the experts working for the Joint Economic Committee in a document called "Productivity, Prices and Incomes." They cite the parallels between today's rate of expansion and the high rate of investment during the 1920s, which they say, may have helped us into the depression of the 1930s.

'Incor' Concrete 'WAFFLE'

Fifty-two Concrete Parabolas Cover 3½-acre Reservoir— Typical 'Incor' Savings



• Kansas City, Kansas, has just roofed its 12-million-gal., 415-ft.-diameter Argentine Reservoir, to prevent algae formation and assure adequate Summer water pressure.

Deriving requisite strength from its shape rather than mass, the hyperbolic paraboloid thin-shell concrete roof design, waffle-like in appearance, cut column requirements by 60%, took only 50% as much concrete as flat-slab construction, saved $21,000 over next lowest alternative design.

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Shells are supported at their centers, which rise 7 ft. 8 in. above edges, by cast-in-place concrete columns spaced 45 ft. 10 in. each way. Shell edges are dowelled to adjacent shells or to flat-slab perimeter area.

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KANSAS CITY, KANSAS

Consulting Engineer:
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Kansas City, Missouri

General Contractor:
EASTMOUNT CONSTRUCTION COMPANY
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Map is more than symbolic. After one year of operation, it shows . . .

Interstate Highway Net—On Schedule

Federal and state government agencies are entitled to take a bow on their accomplishments, as the interstate highway program winds up its first full year of operation.

Obviously this doesn't mean that everything is clear ahead. One major problem—that of the growing opposition to limited access—and numerous smaller ones cloud the horizon. Nevertheless, as an ENR check of the progress of the $100 billion challenge presented by the road program indicates, the fact of accomplishment stands out.

The interstate part of the program is on schedule almost to the mile and to the dollar. As of the end of June, when the program was exactly a year old, a total of 3,030 miles of the interstate net was under contract or under construction. As of the end of May, $3.055 billion of funds had been obligated for the interstate highways—of which $2.003 billion was federal money, the rest coming from the states.

On the primary and urban highways—a total of 21,070 miles of road, including 3,905 bridges, was under contract or under construction for improvement or reconstruction.

In all, at the end of May, a grand total of 6,370 projects, for a total of 22,720 miles of highway and including 5,364 structures, was under contract or under construction.

Set against the provisions of the 1956 Federal Highway Act—signed June 29, 1956—the record is impressive. The bill provided for a federal interstate network of 41,000 miles, to be built under a 13 year program. Actually, however, the total time available is 16 years, since the money authorized by Congress is available for three years beyond the date appropriated. Thus, a rate of more than 3,000 miles a year would produce a system well over authorized length.

The money "draw" on the federal government, in fact, exceeds the rate provided in the law, which set up $1.7 billion as the sum for the first year, $1.7 billion for the second, and did not contemplate reaching the $2 billion figure until the third year.

Keyed to the record is another important fact: The shortage of trained engineering personnel—thought by many to be the most serious weakness in the highway program—has been kept under control, if not beaten.

The highway departments and the federal government haven't succeeded in augmenting their engineering forces—in fact they have suffered a net loss in personnel. But through the aid of greater efficiency in their organizational setups, through use of electronic and other devices, through employment of consultants, through such devices as trading plans for structures, and through standardization, they have managed to keep abreast of the demand upon them.

There's a third point on the "plus" side of the year-end picture too: Enthusiasm and morale are high.

• **Growing cloud**—Most critical problem now facing the program is the public opposition to limited access on the new interstate net.

Highway officials, in Washington

. . . Interstate highway net—On schedule

particularly, are very conscious of this opposition—although they firmly believe that much of the opposition will evaporate as soon as some sections of the new road are actually built and in operation. Much of the opposition is coming from areas in the West, where very few limited-access roads have been built.

Nevertheless, the problem is worrisome. It arises out of what is probably a combination of misinformation and, of course, some knotty problems that affect taxpayers directly since their own homes and businesses are damaged. Out of opposition to the limited-access feature also comes some of the rising price of real estate, as owners—fearing irreparable damage—hold out for the highest possible payments, and fight through every legal avenue available.

And what is feared in Washington is that enough irate taxpayers, writing to enough congressmen, might force enough change in the present law to endanger the limited-access safeguard, which most highway men feel is essential to preserve the usefulness of the new highway system.

Up to now, Congress has shown little disposition to change the basic points in the 1956 law. But under pressure from voters, that disposition could be changed.

• **Politics and right-of-way**—Although the problem of right-of-way—as expected—continues to be a tough one, it hasn't proved to be quite as serious as was at first expected.

Politics has been one of the major bars here as it has been to other areas of the highway program. In many states, legislators of one political stripe and governors of another are unanimously in favor of the highway program. But they are as unanimously determined not to let the opposition political party gain credit for the new roads.

One result of this has been numerous legislative sessions that accomplished little toward needed legislation to unscramble the diverse laws relating to right-of-way.

Another point—also partly chargeable to politics, although much more to real efforts to gain efficiency—has been numerous changes in organization and in chief officers of many of the state highway departments. New highway heads, for example, have only recently been appointed in Utah, Michigan, Ohio and Indiana. Kentucky has recently gone through a complete reorganization of its highway setup. Texas, which had no right-of-way department at all, is now well along toward organizing one.

• **Hiatus due?**—There is considerable debate among highway officials at the moment over whether or not the record pace of the first year will slow down.

It is undeniable that, in order to make the first year record, the highway departments have leaned heavily on the planning shelf—on projects long since prepared, and held on the shelves pending availability of federal money. For this reason, much of the first 1,330 miles of interstate road let to contract doesn't "show"—it is in the heavily urban areas where immediate traffic relief was an obvious need, and where plans had long been available.

Only within the past few months have lettings occurred for roads where more of the general public can see them. At the end of May, for instance, three states—Delaware, Nebraska and West Virginia—had let no contracts at all on the interstate system. Nebraska let its first contract, for more than $2 million, in mid-June. As of May 31, incidentally, Texas led all other states, with 267 miles of interstate roads under construction; North Carolina was second with 98 miles.

Highway officials in Washington are about evenly divided on the question of whether the engineering shortage—rated as "acute," for instance, in such states as Idaho, Tennessee, Minnesota, Vermont—will result in some slowdown in the program some time next year. Many contend that by that time the states will have emptied their shelves and that some delay in getting out new plans must appear. It is undeniable that—despite electronic equipment, standardization and other devices—the minimum time for road planning from first proposal to contract drawings is just short of two years.

However, a slight majority of officials leans to the belief that no letdown will be apparent—on the ground that the use of shelved plans has given the highway engineers the needed time to catch up with new planning.

• **Business to pick up**—A sidelight on the heavy use of older plans, and the concentration on urban areas, has been a somewhat disappointing year for manufacturers of materials and equipment, many of whom looked for an immediate bonanza with the signing of the highway bill a year ago.

Most of the work so far, however, has been in urban areas where great quantities of heavy equipment are not economical, and where the materials emphasis has been almost entirely on steel and concrete for the many structures involved in such work. Most observers now look for a rapid buildup in orders, starting early next year, as the highway program begins to move out of the cities and into open country.

• **The test road**—One of the superficially disappointing incidents of the program's first year was the rejection of the single bid submitted on the new test road, near Ottawa, Ill. (ENR June 13, p. 23). The low bid was roughly 60% over the estimates prepared by the Illinois State Highway Department, which is acting as agent for the joint sponsors of the test loop.

The program immediately posed is this: Results of tests on the road will form the basis for a series of reports, which Congress requested to provide basic information for contemplated changes in the law having to do with allowable truck weights, with apportionment of taxes on various road users and with design criteria.

With some changes calculated to overcome some of the high-cost factors, the test road work is to be readvertised soon, and overall delay in achieving final results may be minimized.

However, the delay may have beneficial results. Bureau of Public Roads officials explain that some of the reasons for the unexpectedly high bid are concerned with contractor and engineer lack of familiarity with the problem of actually building a bad road. For example, one section of the test loop is to be built on recognizably poor subbase for a test of pavement reaction on such a base, but the base as designed was so unstable that paving equipment could not be operated on it, and paving operations would have had to be conducted from the side. New specifications will permit adding material to the base to make it stable enough for more normal paving operations.

Another point—some sections of the loops have been designed to test very

First-Year Report

The Highway Program

Road under contract or under construction	
Interstate system	3,030 miles
Primary and urban systems	21,070 miles
Money obligated (all systems)	
($2.003 billion federal)	$3.055 billion
Money for preliminary engineering and right-of-way acquisition authorized	$703 million

thin paving sheets placed on nearly no sub-grade, a situation typical of states which have no frost problems. Had these sections been completed before frost this year, the tests on them would have been useless in Illinois.

As of this moment, it is expected that paving of the test road will be completed by July 15, 1958. Then will follow an eight-week period of instrumentation, after which the tests can proceed. The delay, incidentally, will also permit use of more instruments than would have been possible had the road gone into service this year.

• **Providing the money**—It is as yet too early to decide whether the taxes set up in the Highway Act will produce as much money as expected for the trust fund that must pay the government's share of the interstate costs.

As of May 31, the returns on the taxes were considerably short—$48 million, to be exact—of the most recently revised estimates prepared by the Department of Commerce. To be exact, as of May 31, a total of $1,314,725,050 had been deposited in the trust fund. Expenditures totaled $844,638,811—including $347.7 million repaid to the general fund for advances made earlier in the year.

No one is yet concerned about the apparent shortage, since it has been pointed out that slow returns from the new gasoline taxes, errors in reporting of taxes and assigning of funds, and delinquent accounts due to lack of familiarity with the tax, can account for the difference.

On the state side—after an extremely slow start—the legislatures have now made appropriate moves to supply their 10% share of the interstate and 50% share of the urban and primary road costs. These provisions are being made through increased taxes, through bond issues, and other devices.

• **Materials**—At the end of the first year, materials and equipment shortages do not seem to be a serious problem. Spot shortages, mostly of steel, have appeared in some states (notably in the Southeast) but substitution of other materials seems to have kept the problem from reaching calamitous proportions.

Labor—excepting in New Hampshire and the Dakotas—has been no problem.

• **More coming**—On one point, all observers are agreed:

The program as outlined in the 1956 act is only the beginning. More than a good bet is the prediction that the highway program will be extended by perhaps seven years and by several thousand miles.

The signs are strong already. The original act set up an extra 1,000 miles (over the 40,000 miles that had been agreed upon in earlier surveys of need) to take care of unexpected additions to the mileage through new routing, and for any new additions that might be deemed necessary. The states immediately began requesting additional mileage. Their requests now total 12,500 miles of additional roads. Congress now has before it a bill to add 7,000 miles to the program—a bill that's given no chance of passage this year, because it was tacked as a rider on other measures affecting billboards and advertising signs on the new roads.

But it is obvious that additions will be made that will stretch the road system both in mileage and in time—and both dimensions will be considerable.

As to other legislation affecting the program, most observers feel that no basic changes will be made. There has been to date, very little evidence of graft or corruption in the program (Indiana's recent land scandal is an outstanding exception) that would indicate need for great tightening of the law.

• **Enough money?**—One other indicator of the need for more legislation lies in the cost picture. Not the costs of the roads themselves—although prices for construction here, as everywhere, have risen. The big jump, however, has come in the difference between the states' estimates of what they would need—a study completed in 1954, and on which the 1956 law was based—and the results of the most recent studies of those needs. In some cases, according to unofficial sources, the difference between the 1954 estimates and the present is as much as 100%.

Reasons include rising land costs, as well as costs of construction, plus the addition of many new features, many new interchanges and structures, to original plans. It seems clear that as new and more realistic estimates come in, the price tag will go higher.

Warped Concrete Shell to Roof Store

Shown near completion in the photo is wood formwork for a hyperbolic-paraboloidal concrete shell covering nearly 15,000 sq ft. The structure will roof a portion of the Daniels & Fisher Department Store, a unit of Webb & Knapp's $35 million Court House Square development in Denver.

In plan, the roof will cover a post-free rectangular area 112 x 132 ft, but the walls—glass on steel framing—will be set back 17 ft from the shorter sides and 12 ft from the longer. The remainder of the store will be conventional construction, five stories high. Four basements, for parking, storage and maintenance facilities, will underlie the whole store.

Hinge-connected to steel buttresses, the shell is supported only at the four corners, 4½ ft above ground-floor level. It reaches its maximum height of 32½ ft at the center. The buttresses are tied diagonally across the building by wide-flange steel beams under the floor.

Constructed of reinforced concrete, the shell will be 3 in. thick. It will actually comprise four hyperbolic paraboloids, joined along the ridge lines. Integrally cast, the four quarters will share common edge beams along the ridges. Roofing will be five-ply asphalt and felt, topped with gravel.

Architects for the project are I. M. Pei & Associates. Consulting engineers are Roberts & Schaefer. Webb & Knapp Construction Corp. is the builder. All are New York City firms.

Asphalt Due Back for Paving Jet Airfield Runways

Congress orders Air Force, Engineers, to produce new study for use of material on central runway sections

Asphalt pavement soon will be back in the bidding for Air Force runways.

That was the way Washington sized up the situation this week as the House Armed Services Investigating Subcommittee took the first step toward restoring competition between asphaltic and portland cement concrete for air base paving.

Concluding six days of hearings on the hearings on the pavement controversy, subcommittee chairman F. Edward Hebert ordered the Air Force to get together with the Army Engineers and report by Aug. 1 on proposed reinstatement of asphalt construction for the central portion of runways. At the final hearing session, the construction officer of the Corps of Engineers—principal construction agent for the Air Force—testified that he can build an asphalt pavement today in the central section of runways that will stand up under channelized traffic of the heaviest bombers. Air Force officials said they still have to be convinced.

At issue throughout the hearings were:

(1) The Air Force edict of last year banning asphalt construction and

(2) The severely criticized Kelly Field tests which supposedly validated the Air Force decision. On the first point, Congressman Hebert said that the Air Force by changing its criteria last year had "arbitrarily circumvented" an agreement made after 1954 hearings before the same committee. On the second, asphalt interests strongly attacked the demonstration test at Kelly AFB, while the Air Force stoutly defended both the fairness of the test and the conclusions drawn from it.

• **Attack requirements**—Witnesses for the asphalt industry, representing the Asphalt Institute and the paving contractors group—the National Bituminous Concrete Assn.—told the committee how the Air Force had rewritten its pavement requirements to bar the flexible type from airfield areas where it formerly was accepted.

The House committee in 1954 had compelled a reluctant Air Force to give up a price differential favoring portland cement concrete in bids for so-called non-critical areas of pavement. This action restored asphalt to competitive equality in bidding on all pavement except that for critical areas—those subject to damage from jet blast and fuel spillage, including aprons, warm-up pads and 1,000 ft at each end of runways. Everybody agreed that rigid concrete pavement could properly be specified for the critical areas.

Last year the Air Force broadened its definition of critical areas to include all pavement used by combat and combat-support aircraft. This sweeping change practically excluded asphalt pavement from new airfield construction. Air Force officials contended the action was necessary to meet the relatively new problem of channelized traffic (plus high-pressure tires) under heavy aircraft like the B-47 and B-52 bombers, which concentrate their travel in narrow strips down the center of taxiways and runways.

• **Test unfair?**—Attacking the Kelly test, asphalt people asserted that the demonstration could not have had any other result than to substantiate the Air Force decision.

The asphalt experts contended that the so-called failure—limited entirely to rutting of the surface 1½ in. deep—was the result of a too-rich mixture containing more bitumen than it should have. And they declared that the test lost much of its value when the rutted surface was not immediately replaced with a better designed mixture to permit accelerated traffic to continue.

In answer, Air Force spokesmen pointed out that the Army Engineers had designed the Kelly pavement in its entirety expressly for the test, with full consideration of all information available at that time. Admittedly, there never had been any previous test approaching the severity of the Kelly program, which called for 30,000 coverages with tandem gear weighing 100,000 lb each—as compared with previous experiments consisting of no more than 1,500 round trips. Failure was declared for the rutted asphalt pavement at Kelly after 9,000 coverages.

As to why the traffic test had not been continued with a resurfaced asphalt section, Air Force spokesmen said no second trial had been considered because the results already obtained were regarded as conclusive.

• **Can or can't?**—Maj. Gen. Walter K. Wilson Jr., Deputy Chief of Engineers for Construction, told the committee he is sure that he can place flexible pavement in the interior portion of runways (between the runway ends of rigid pavements) that will carry concentrated, channelized traffic of the 456,000-lb B-52 bombers.

In the central portion of runways, operating aircraft are moving and are partially airborne. Gen. Wilson thinks the 1,000-ft runway ends of rigid pavement are probably long enough but he wanted Air Force judgment as to whether they should be longer.

Gen. Wilson proposed thickening or otherwise strengthening the pavement in the central 25 ft of 75-ft runways to carry channelized traffic. For the present, he would recommend portland cement concrete for this 25-ft center strip, with either type for the two side strips, whichever is lower in cost.

(Arvin S. Wellborn, chief engineer of the Asphalt Institute, gave the institute's opinion that the runway ends need be no more than 500 ft long. Studies of runways paved entirely with asphalt show no damage beyond 300 ft from the extremities, he testified.)

For the Air Force, John M. Ferry, special assistant for installations in the Office of the Secretary, said he has seen no evidence that assures him satisfactory asphalt pavement can be designed for channelized traffic of heavy bombers in the central portion of runways.

• **What's ahead**—The Army Engineers are asking the Air Force to allot $800,000 a year for four years to carry out research and testing of asphalt pavement.

Congressman Hebert asked Mr. Ferry if he would give them the money. Mr. Ferry said no, not $800,000; he considered that sum extravagant for this research program. Since 1952, Mr. Ferry said the Air Force has invested in Army Engineer investigations $2,528,000 for flexible pavement and $2,150,000 for rigid pavement. Answering a question, Mr. Ferry told Congressman Hebert that, if asphalt representatives offered a pavement design they said would stand up under accelerated, channelized traffic and asked for another test like Kelly, he would give them the desired test, but only if the industry shared the cost as part of its sales effort.

The Air Force, Mr. Ferry declared, "is extremely anxious to find a competitive pavement that will work and cost less."

C. R. Foster, chief of the Flexible Pavement Branch of the Army Engineer Laboratory at Vicksburg, Miss., told the committee that tests now completed there should produce tentative criteria this summer for designing pavement that will withstand accelerated traffic testing under B-52 tandem gears loaded to 240,000 lb on each gear. Another one to two years would be needed for checking and verifying the criteria.

• **Costs**—Stiffer standards have boosted the cost of flexible pavement 30% on the average since Dec. 1955, as compared with 9% for rigid, Mr. Ferry said. But the asphalt pavement average cost still is lower, despite the influence of some unusually expensive jobs that raised the average asphalt square yard cost to $6.08 as compared with $7.58 for concrete. In the 3½ years prior to Dec. 1955, the asphalt average was $3.67 per square yard; concrete, $6.89.

The Asphalt Institute gave a pointed example of increased pavement costs. Paving at Dow AFB near Bangor, Me., had previously been awarded part asphalt and part concrete for a price of $2,920,241. After the change, the contract was renegotiated all-contrete at $5,873,873, according to J. E. Buchanan, president of the institute.

Work Pushed in Detroit On ACI Headquarters

Construction is under way on the new headquarters office of the American Concrete Institute in Detroit, Mich.

The building (ENR June 14, 1956, p. 17) will be 97 x 37 ft in plan and cost about $275,000. Its dominant feature will be a folded-plate thin-shell concrete roof, cantilevered 19 ft front and rear from monolithic concrete corridor walls. Several types of special precast concrete units will also be used.

Detroit architect Minoru Yamasaki designed the building. Ammann and Whitney, of New York, are consulting engineers. Pulte-Strang, Inc., Ferndale, Mich., is the general contractor.

Missouri Legislature Passes Mild Pollution Control Bill

A law establishing a six member Missouri Water Pollution Board empowered to set up standards of water purity and regulate discharge of sewage and industrial wastes has been passed by the state legislature at Jefferson City near the end of its 1957 session.

The measure is far from saber-toothed in its enforcement provisions. It was passed despite the opposition of St. Louis and Kansas City.

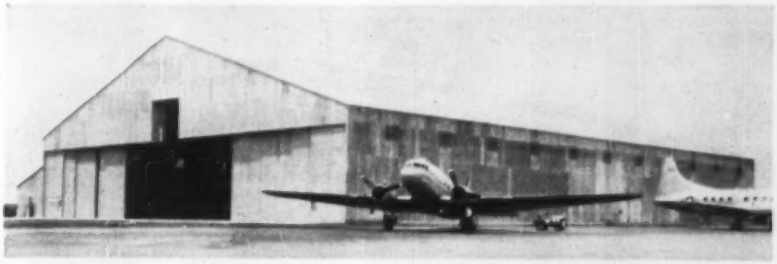
Supporters of the bill, mostly from rural areas, argued that exclusion of any parts of the state would make the law ineffective. However, they did exclude drainage districts, fearing that use of weed-killing chemicals might be construed as pollution and that proper maintenance of drainage ditches might be hampered.

The Water Pollution Board is to be bi-partisan, appointed by the governor with the advice and consent of the Senate. Members will serve six years.

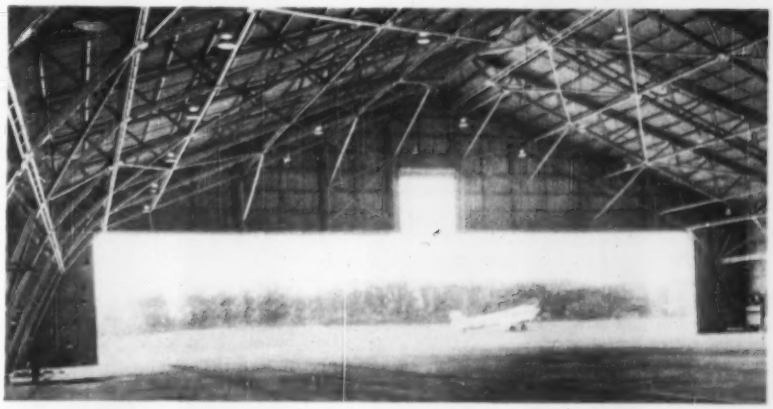
Whenever the board determines that any person is discharging sewage, industrial waste or other wastes into any waters of the state in a degree that prevents the water from meeting the established standards of water purity, the law provides, "The board shall act to secure the person's cooperation in the reduction or elimination of the detrimental effects of the discharge."

Provision is made for coping with instances of refusal to cooperate, for the holding of hearings by the board and for judicial review of board decisions. The law directs the board to allow reasonable time for compliance before it issues or enforces orders for reducing or eliminating pollution.

Violations are punishable by fines of not more than $500, or by imprisonment for not more than 90 days.



Package-Type Steel Hangar Is . . .



. . . Big Enough for Two Jet-Liners

Dedication ceremonies at Baltimore's Friendship International Airport last month marked official completion of a package-type steel hangar designed for the jet age.

With a post-free interior 200 x 300 ft, the building can house two jet passenger liners such as the Douglas DC-8 and Boeing 707, both of which are on order by commercial airlines in the U. S.

The building was manufactured by Luria Engineering Co. Adapted from a standard design of the firm, the structure was fabricated at Luria's plant in Bethlehem, Pa., and then it was trucked to the site as knocked-down components.

Including foundations and a 25 ft wide leanto along one side, the hangar cost the city's Department of Aviation $688,000—just under $10 per sq ft.

The steel frame of the structure consists of 3-hinged trussed arches, roof purlins and intermediate wall framing. Corrugated galvanized steel roofing and siding, insulated with one inch of glass fiber, enclose the building. For daylighting, the side walls include some panels of corrugated glass-fiber-reinforced plastic.

Each end of the building has 30 ft high, center-parting folding doors, with a 15 x 15 ft notch for tall tail assemblies. At present the doors open to a width of 160 ft, but if wider entrances are needed in the future, pockets can be built to permit the doors to clear the full 200 ft width.

Pan-Maryland Airways, lessee of the hangar, will operate it as a public facility. Consulting engineers for the project were Whitman, Requardt & Associates, of Baltimore. Luria was the hangar contractor, also handling the erection. Redding & Co., Inc., of Baltimore, constructed the foundations and other facilities.

Report Blames Design for Roof Failure

Defective design of concrete block walls and prestressed concrete roof slabs are claimed by a board of investigators to have been responsible for the Aug. 30, 1956, failure of a section of the roof of a Florida school.

Completed about one week before the failure, the roof spanned about 56 ft over the cafetorium of the $404,000, 24 classroom Frances L. Blankner Elementary School in Orlando. In the collapse, during a nighttime rainstorm, a concrete-block bearing wall toppled outward and eight 5 ton double-tee prestressed beams fell to the floor of the one-story building (ENR Sept. 20, 1956, p. 27).

COLLAPSE OF SCHOOL ROOF in Orlando, Fla., last August now is attributed to ponding of water on excessively deflected beams, which pushed out walls.

• **Rain did it!**—In a report just released by the Prestressed Concrete Institute, a board of investigators offers the following explanation for the cause of the failure:

1. The collapse was not caused by ultimate failure of the slabs.

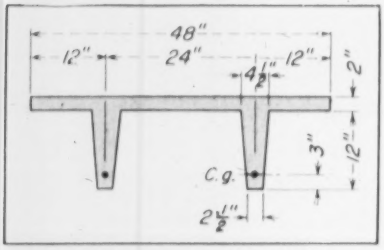
2. The design of the roof slab was defective in that the extreme fiber stresses exceeded the allowable.

3. Cracking of the slab resulted in excessive deflection and thus ponding of water on the roof, which brought about more deflection and also rotation of the slab at the supports.

4. Bearing points of the slab on the concrete block wall were eccentric and the wall design was inadequate.

5. The rotation of the slabs shifted the bearing point, causing the wall to collapse. This wall had window openings from one end to the other. Its pilasters and the tie (bond) beam were inadequately designed.

The board of investigators consisted of Ross H. Bryan, consulting engineer, Nashville; H. H. Edwards, president, Leap Concrete, Inc., Lakeland, Fla., and Prof. A. M. Ozell, University of Florida, Gainesville.



ROOF BEAM is a precast double tee, prestressed by seven bonded strands in each leg. Cracks were observed near quarter points, where three of the tendons are sheathed in paper tubes. Plot of estimated bottom-fiber stresses (right) indicates that as little as 10 psf of water ponded on the roof could have created enough tension (shaded area) to create these cracks.

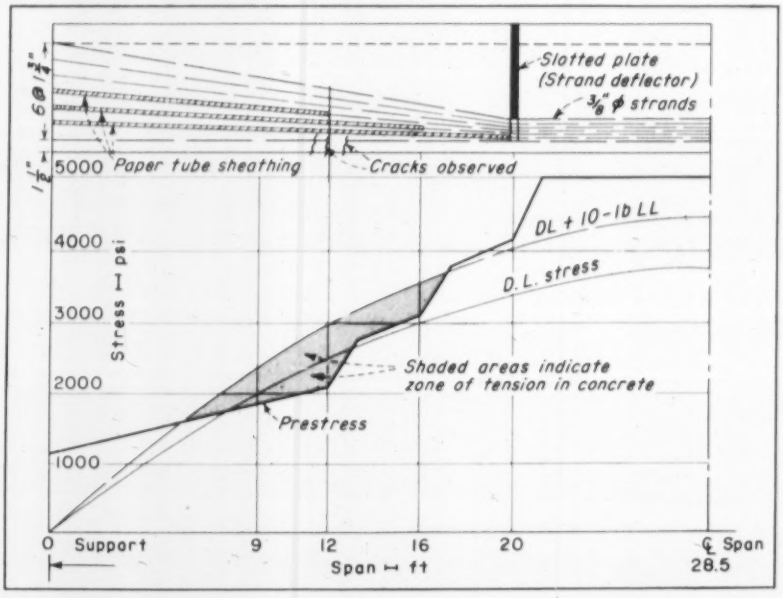
• **What were the defects?**—The brief report does not disclose the nature of the inadequacies in the design. However, from talks with several engineers who had inspected the wreckage and from design drawings, some clues can be found.

In the drawings below are shown the dimensions of the double-tee roof slabs and arrangement of tendons. It is noteworthy that three of the seven strands are sheathed in paper tubes near their ends to prevent bond with the concrete and thus transfer of prestress. The resultant prestress in the bottom of the beams is plotted in the diagram.

Also in the drawing is shown the estimated dead-load stresses, based on a total dead load of 220 lb per lin ft. The plot indicates that near the quarter points, where the strands are sheathed, the prestress is insufficient to counteract the dead-load stresses. A tension of about 400 psi could have existed. Computed deflection is about 1.5 in.

Assuming an average weight of ponded rainwater of 10 psf, the resulting stresses are also plotted below. The tension increases to about 800 psi—enough to crack high-strength concrete—and with additional ponding of water as the roof bent, the deflection could increase to more than 2 ft. (Some observers reported cracks about 10 to 15 ft from the ends of beams that did not fall down.)

Deflections of that magnitude probably would cause the eccentricity of bearing pressure on the walls referred to in the report. Perhaps, if the strands had not been sheathed the disaster would not have occurred.



River Sets Record

Missouri water storage stands at all-time high

The amount of working water stored in the Army Engineers' Missouri River dams increased 28% in the first 21 days of June.

The Reservoir Control Center at Omaha, in announcing the increase since June 1, said that the amount of Missouri River water now in storage stands at its highest figure in history.

The water stored behind the four upstream dams is 19.5 million acre-ft—or more water than flowed down the Missouri River in the entire year of 1956. The total compares with the previous high of 18.1 million acre-ft in 1948, stored behind Fort Peck Dam, which was at that time the only dam in existence.

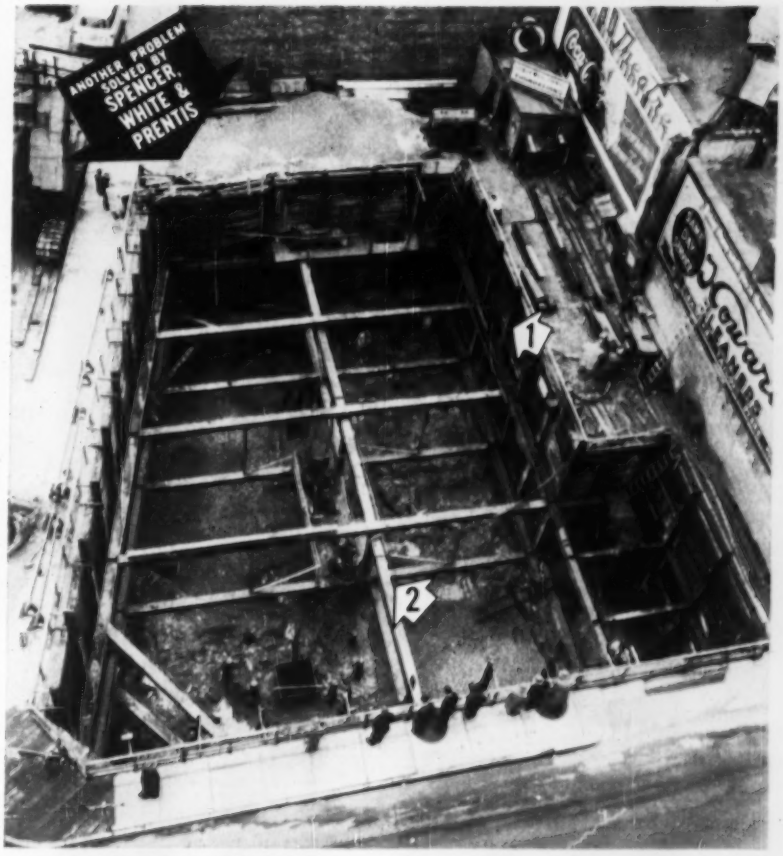
The increase in water storage comes from three sources, center officials say. They are:

- Melting of snow in the mountain headwaters of the Missouri. This is about normal in amount.
- Runoff producing rains in the plains tributaries of the upper Missouri. Some of the streams—the Bad, White and others—are contributing rain runoff for the first time since the dams have been built.
- Runoff from the lower river tributaries—among them the Platte and Kansas—located below the dams. Releases from the dams can be cut back in the amount that these streams contribute water to the lower river.

• Benefits accrue—The increased supply of stored water has direct practical effects, according to the Reservoir Control Center. One such effect is the increased power production. The output of Garrison Dam, for example, has been upped 20,000 kw with no increase in the amount of water used—just increased head.

Navigation stands to benefit, too. The Reservoir Control Center met in April with the representatives of federal agencies and basin states to plan the allocation of Missouri River water. At that time the announced navigation closing date of Nov. 1 or 15 was coupled with a warning that the navigation season might have to be closed earlier if dry conditions persisted. Now the possibility of an abnormally early closing has been eliminated.

Prospects are that the year's inflow into the Missouri will "top out" at 21 million acre-ft. While this is below the normal water yield of 25 million acre-ft, it compares favorably with last year's total of 19 million acre-ft. During the drought of the 1930's water yield of as low as 13 million acre-ft was recorded for the Missouri.



HANDLE DEEP WET EXCAVATION WITHOUT STEEL SHEETING

1. SOLDIER BEAMS AND HORIZONTAL WOOD SHEETING
2. TWO TIERS OF CROSS-LOT BRACING
BOTTOM OF EXCAVATION 30 FT. BELOW CURB

Project: Sewage pump station and office building for Hampton Roads Sanitation District Commission
Engineers: Buck, Seifert & Jost, New York City
General Contractor: W. F. Magann Corp., Portsmouth, Va.

In the center of downtown Norfolk, just a few blocks from the waterfront, a deep and unusually difficult excavation was required, in wet clay, sand and silt, almost entirely below ground water.

In view of much past experience in the area, it was assumed that steel sheeting would be required. Spencer, White & Prentis specialists, however, solved the problem successfully (and more economically) using soldier beams and horizontal wood sheeting. Existing electrical utilities and buildings, which added to the complexities of the job, were in no way disturbed.

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Salaries Increase

Biennial survey shows pay up in all employee grades

The Committee on Salaries of the American Society of Civil Engineers has released its 1957 report, showing a marked increase for all grades of employees since 1955.

As in previous years, this fourth biennial survey by the ASCE committee found the greatest percent increase registered by those in the lower professional grades. That is, salaries for those who are just starting continue to grow fastest.

But, the report points out that this year the percent increases tend to remain relatively high through Grade VIII of the nine grades into which employees studied are divided. Grade VIII includes assistants to the technical and administrative heads who make up Grade IX, top salaried employees in civil engineering work.

Increases over the two year period of the survey range from about 20% for Grade I beginners to about 14% for Grade VIII. Grade IX registered a 5% increase. The committee concludes that the pressures for higher salaries—originally felt only the immediate post-graduation period—are now extended throughout the entire salary scale. Yet the entrance rate continues to advance substantially, this report's figures showing the greatest two year advance since the surveys began.

• **By type of employer**—Pay boosts for civil engineers in the consulting field parallel closely the national average for all types of work; municipal and county engineers reportedly have gained faster than average; and upper grades in "construction, state highways, utilities and industries show increases of much lower order of magnitude than the lower grades."

In actual dollars, the report finds median salary for entrance to Grade I up $780 from 1955 to about $4,780. It does not give a median pay figure for each grade of salaried civil engineers, only the starting grade of new graduates. But it does give in detail the breakdown of salaries within grades for each of its six categories of employers: consultants, contractors, state highway departments, municipalities and counties, colleges, and a final grouping that is composed of roads, utilities and industries.

Findings are based on 297 returns from organizations employing nearly 48,000 civil engineers. In addition, the federal civil service salary scale, which has been found to have increased by 7% over two years ago, is published as part of the report.

Responses to questions on fringe benefits lead the salary committee to conclude that they amount to about 15% of salary. Vacation and sick leave pay; bonuses and profit sharing; retirement, health and life insurance plans were all considered in this figure. Retirement plans were reported by only 32% of private firms responding, while 60% of them have health and life insurance programs.

Among the public agency employers of civil engineers, on the other hand, 89% report they have retirement plans, while health and life insurance plans were reported by only 22%.

This 1957 ASCE Salary Survey is to be published by the Society in full in August as a proceeding paper in the JOURNAL of the Board of Direction.

Paul Starrett Dies at 90, Noted Skyscraper Builder

The year that Paul Starrett, who died last week at the age of 90, began work as a draftsman for the Chicago architectural firm of Burnham & Root the first true skyscraper with skeleton walls was completed. This was the 12 story Tacoma Building in New York City. During the following 60 years he was to become the nation's most famous builder of structures of this type, climaxing his career with the construction of the Empire State Building, whose equivalent height of 102 stories is still an unrivaled record.

As president, first, of the George A. Fuller Co. from 1905 to 1922, and thereafter of his own firm of Starrett Brothers & Eken, he directed construction of notable buildings in most of the major cities of the country, including Cleveland, Washington, D. C., Baltimore, Chicago, Philadelphia, Detroit and Cincinnati. New York's best known early skyscraper, the Flatiron Building, was one of his products, as was the Pennsylvania Railroad Station, the main post office, the old Hippodrome, the Bank of Manhattan building and a half dozen of the principal hotels in that city. For a time in the 1920s his firm was credited with doing 80% of all the skyscrapers in New York.

Born in Lawrence, Kan., the son of carpenter-preacher, Mr. Starrett left school at the age of 16 to work at various odd jobs until, in 1887, he settled in the drafting position with Burnham & Root, where before he left, 10 years later, he had worked on the designs of the buildings for the Chicago World's Fair. Only eight years after joining the George A. Fuller Co., he was made its president. Mr. Starrett retired from active participation in affairs of Starrett Brothers & Eken about 15 years ago.

In California and the World Over

Rock Really Rolls

with Bucyrus-Eries Loading

Granite-heaped hauling units flow steadily from beneath the dipper of this 6-yd. Bucyrus-Erie 150-B shovel — one of two such units being used by Morrison-Walsh-Perini in construction of the Wishon Dam for the Pacific Gas and Electric Company.

This $12-million rock-filled dam will be located on the north fork of the Kings River, 88 miles east of Fresno, California. It will require excavation of 3½ million cubic yards of granite and impervious material.

This long, tough job, scheduled for completion in November, 1958, demands excavators that will maintain consistent, high production month after month. Bucyrus-Eries have the design and manufacturing extras to give that kind of performance in the toughest of digging. Outstanding front-end design, for instance, with tubular dipper handle, provides extraordinary strength without extra weight. Freedom of the handle to rotate in the saddle block eliminates torsional stresses during digging.

The field-proved quality built into Bucyrus-Erie machines makes them the choice of the men who handle the big jobs like this Wishon Dam project. Write for full information on the Bucyrus-Erie 110-B, 150-B or 190-B heavy-duty excavators. 131L57C

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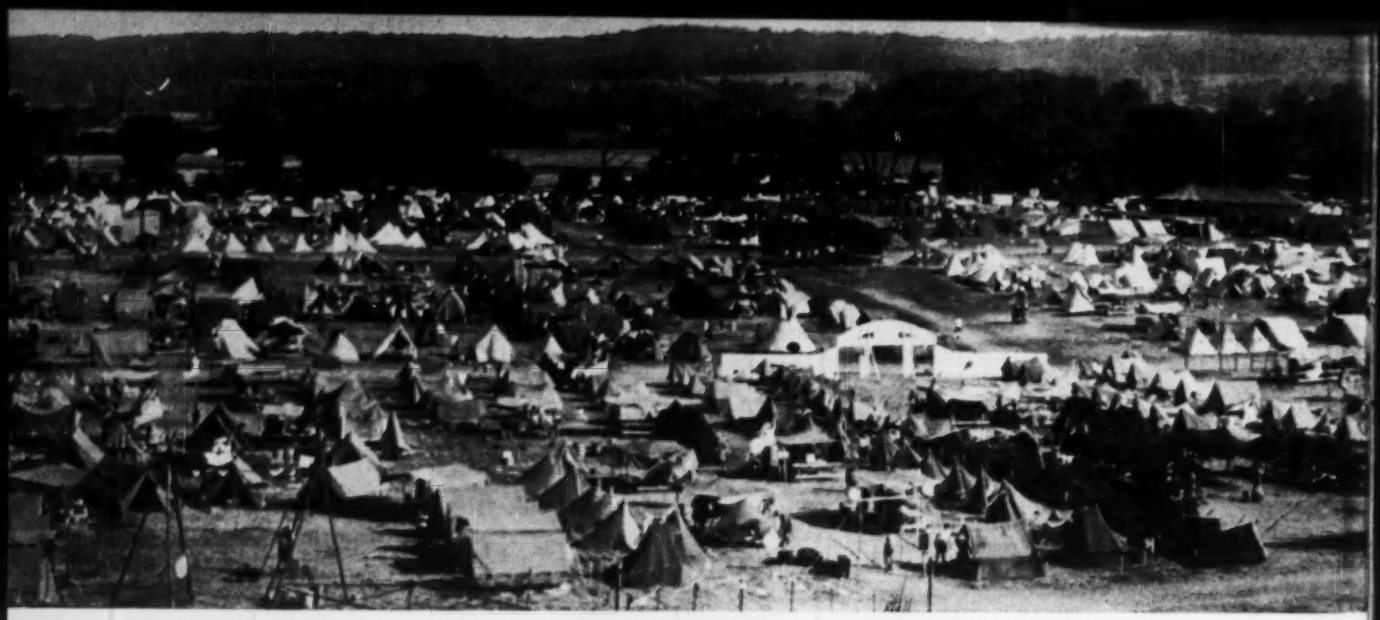
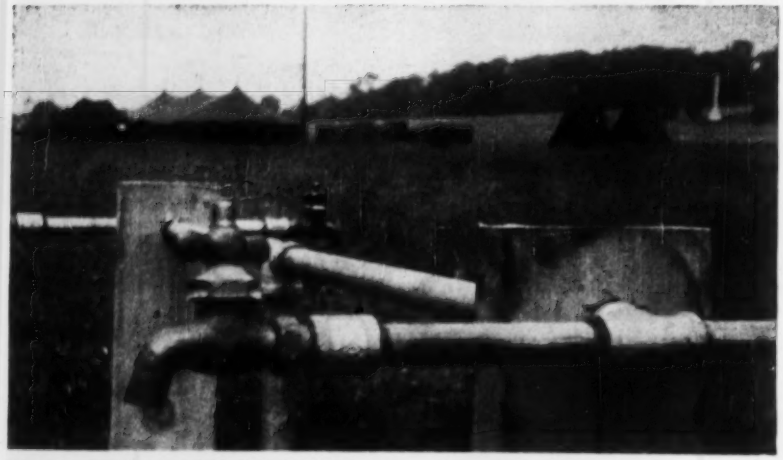


When 50,000 Boy Scouts of America get together . . .

A National Jamboree Is More Than Tents



Water supply—52,000 ft of pipe, 304 outlets . . .

Drainage—18,000 ft of 3 to 6 in. pipe

By tomorrow, July 12, over 50,000 youths of America will have settled down for a good week of living together. The Boy Scouts of America, with tents pitched over 1,500 acres of Pennsylvania's Valley Forge Park, historic site of the American Revolution, are once more gathered for a National Jamboree, their fourth.

The temporary "city" they will inhabit has entailed some degree of site preparation—for while the scouts bring with them tents, appetites and their well-known resourcefulness, certain basic facilities must be provided to make the seven-day stay a physical possibility.

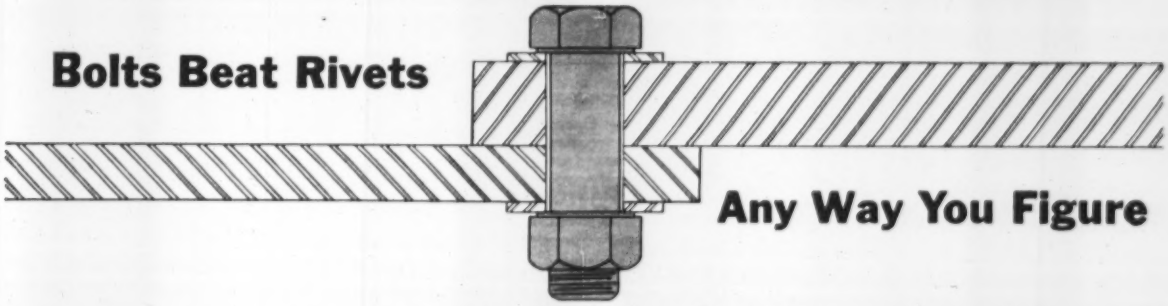
The first is water, in amounts up to 1½ mgd. Philadelphia water mains crossing the park have been tapped and the water carried through 52,000 ft of 4 to 1 in. galvanized pipe laid to provide two drawing stations, with four outlets, for each section. (There are 38 sections, each with 35 troops of 40 scouts and leaders to a troop.) Reducer valves were used at connections to the city's high pressure mains.

Sanitary facilities in the form of latrines, garbage disposal and showers are another must. Latrines are 4,500 12-in.-dia. holes dug 6 ft deep by powered auger, three holes to a troop. Seats will be assembled and placed over the holes by the scouts.

Twenty-four-head gang showers have been put up for each section. To carry away waste water, and also to drain some low-lying areas, about 18,000 ft of 3 to 6 in. asphalt-impregnated fiber pipe have been run to porous ground.

The troops will cook their own food

Bolts Beat Rivets



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Less labor: Two men can be trained quickly to fit and tighten 350 to 450 bolts per shift. Compare that with 175 rivets for the average highly skilled (and scarce) four-man riveting crew which requires years of training.

Lower costs: A leading architectural journal says high strength bolts are replacing rivets at savings up to 40%.

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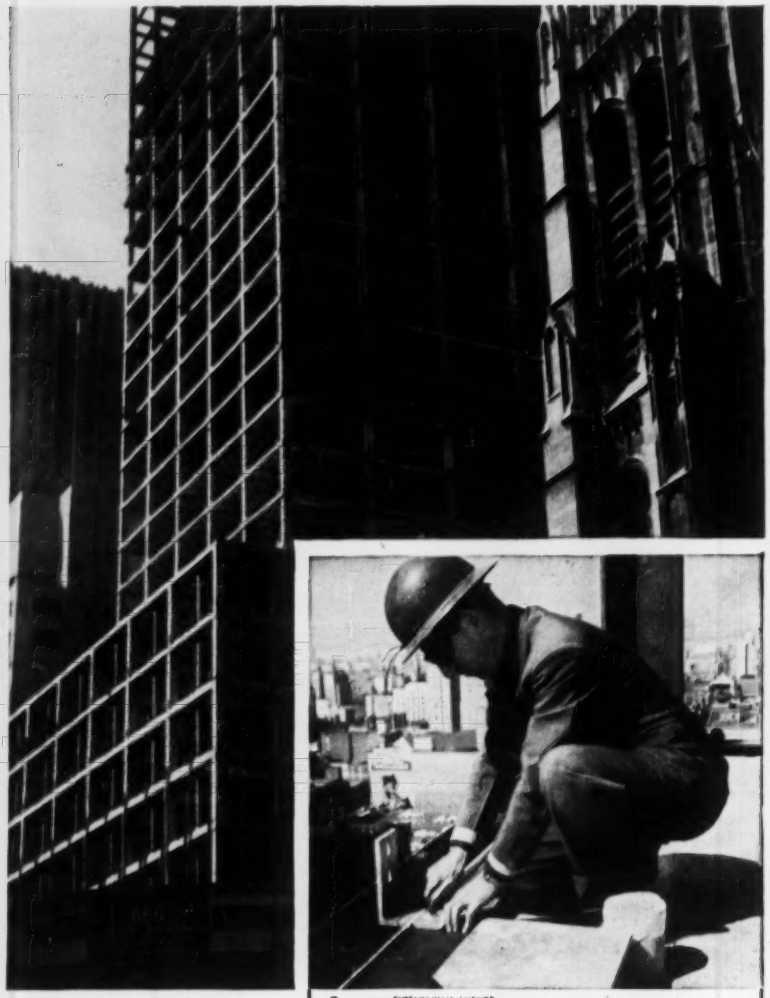

Tishman Building,
666 Fifth Avenue, New York.
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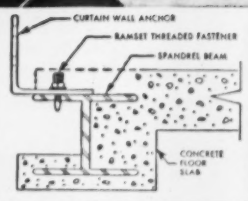
F. H. Sparks, erector.



Foreman checks curtain wall anchor bolted to RAMSET stud set in structural steel beam.

Fastening detail shows how RAMSET-threaded fastener holds curtain wall anchor firmly in position.

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helps skeleton don skin . . . in a hurry!

This skeleton was ready for its curtain wall exterior ahead of schedule. The steel flanges to which curtain walls are attached, were fastened to the beams with RAMSET powder-actuated fasteners . . . *15 times faster* than old-style methods, because RAMSET eliminates pre-drilling! Says the erector, "RAMSET is the most satisfactory and economical method of setting curtain wall brackets for collateral steel work."

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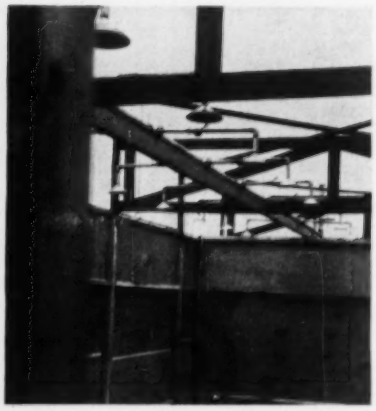
. . . National Jamboree



Showers—38 24-head gang showers . . .

Sanitation—4,500 auger-dug latrine holes.

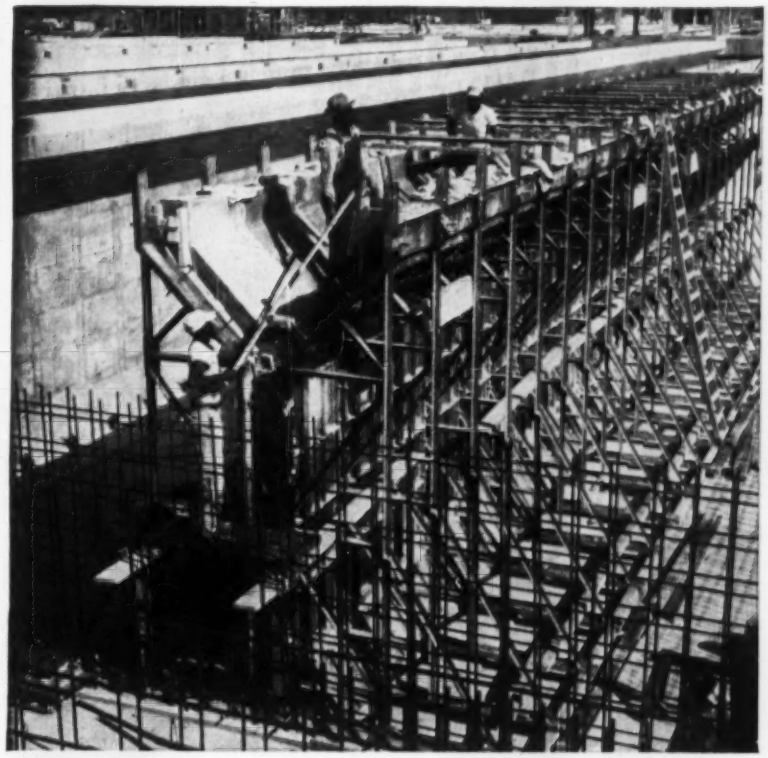
—drawn from commissary tents—over charcoal fires and eat out of paper ware. Garbage will be put into paper bags and trucked out to a 4,000 cu yd hole scooped out of the ground.

Though not a basic, but still a necessity for the Jamboree, an amphitheater has been shaped out of a hillside in the area. Topsoil pushed down the hill forms an earth stage 100 ft deep by 300 ft wide which has been blacktopped. The hill is grassed and is expected to hold 55,000 to 60,000 people.

Electricity, for the commissaries and other big central tents in each section, is being bought from a local power company. The GHQ area for the camp will have tents housing press, phone and telegraph facilities.

Armed services equipment has been loaned to the Jamboree in the amount of $2¼ million. The Army has supplied tents, trucks and help. The Navy has provided 125 big electric refrigerators.

Engineering Service of the Boy Scouts of America is in charge of Jamboree construction; Joseph E. Bishop is director of the service. Henkels and McCoy Co. of Philadelphia is general contractor for the job.



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.

CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System *saved 40 percent in material costs alone.* In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-usage to give the contractor lowest all around form costs.

Y wall trusses designed to member with standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog—or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

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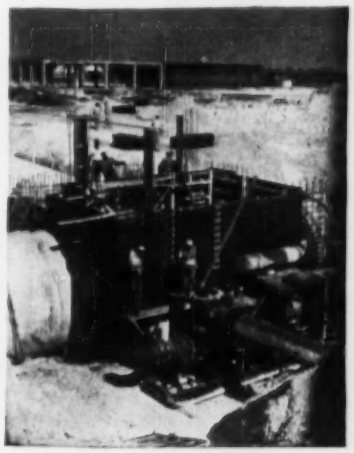
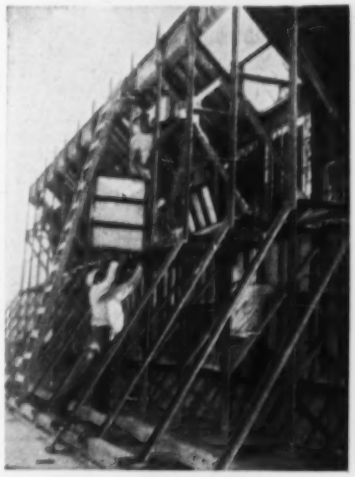


Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.

One side aligning and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.

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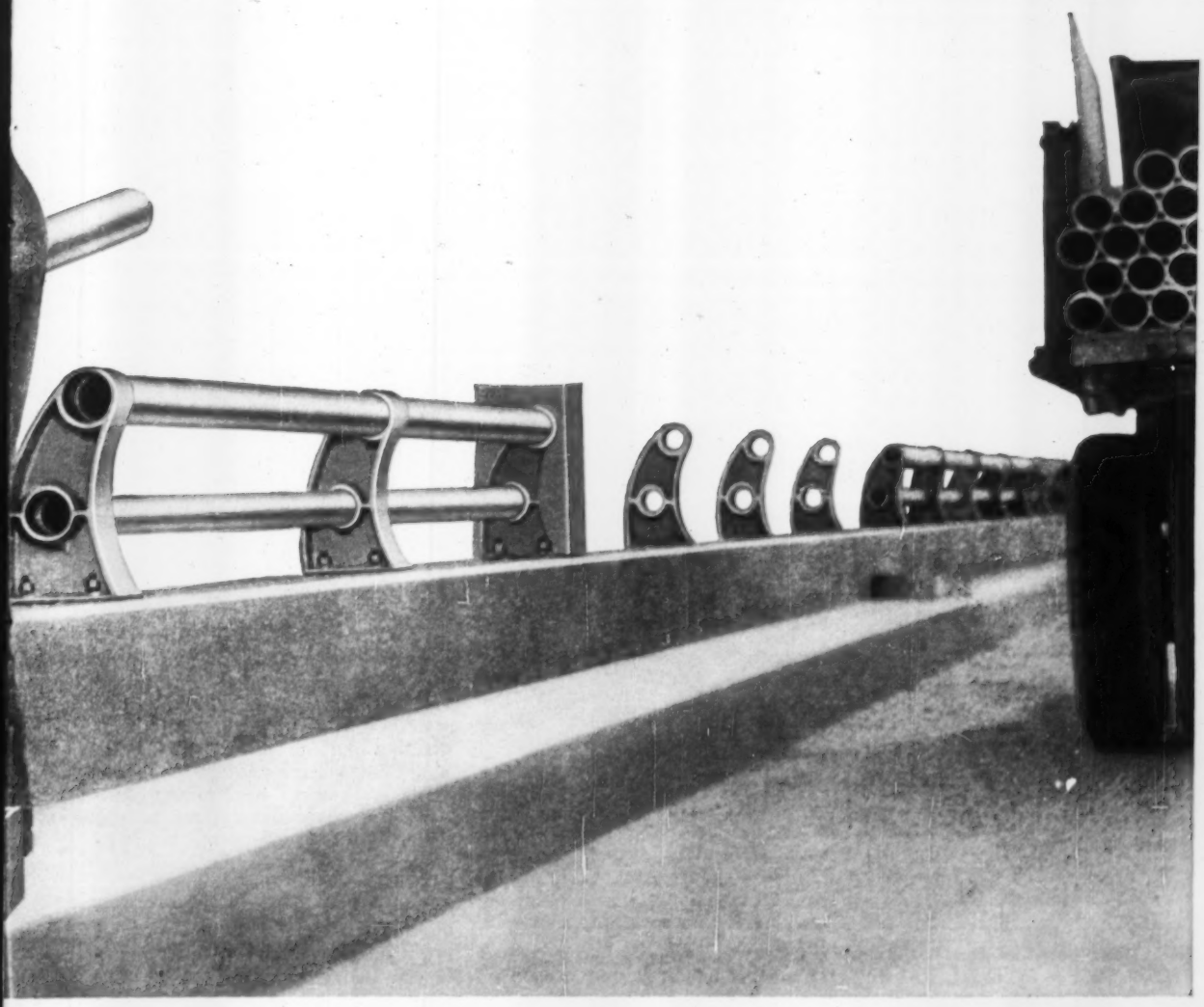
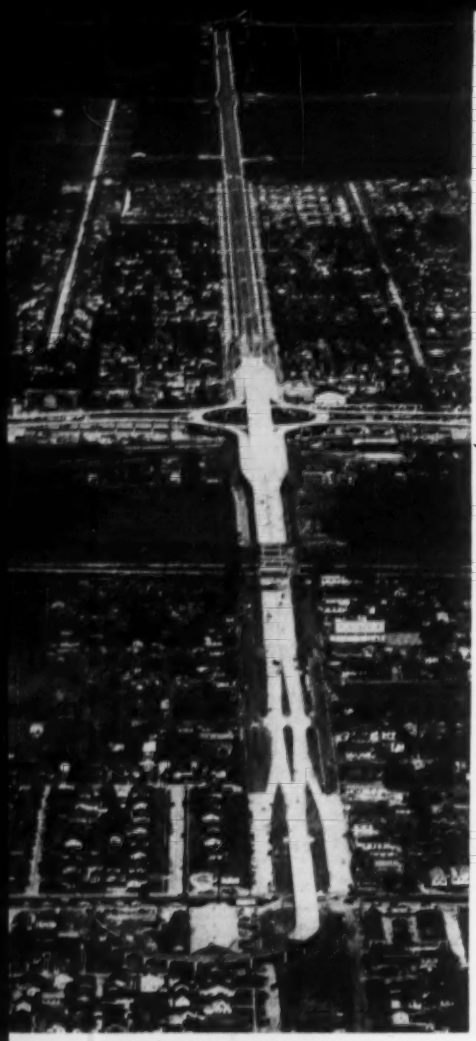


Unique Interchange Is



CAUSEWAY BOULEVARD, with Lake Pontchartrain Causeway at the top, the Airline Highway Interchange, center and the incomplete Jefferson Hook, bottom.

Work is nearing completion on an interchange—incorporating a unique elevated rotary roadway—that is a major key to the Greater New Orleans Expressway. Proposed and planned two years ago (ENR June 16, 1955, p. 49), the complex congestion-breaker is now becoming a reality.

When complete, the interchange will feed traffic to and from the 24 mile Lake Pontchartrain Causeway and Airline Highway, a principal east-west route. The location is three miles south of the causeway and one mile north of Jefferson Highway (U.S.90).

• **Turning movements a must**—Traffic is already extremely heavy at this location and added impetus has been given to future growth in the area by construction of the Veteran's Memorial Highway, the Greater New Orleans Expressway and interrelated projects.

A great deal of local traffic also is expected on Causeway Boulevard because of the fact that it is the only clear north-south route in East Jefferson Parish. This necessitated a design to accommodate the great number of turning movements expected daily. Other major factors influencing design were financial limitations, a complex of railroad tracks and switching yards, and Metairie Road—a local artery just north of the intersection.

At least a dozen possible schemes were proposed. The final selection is both technically unconventional and bold in design.

The structure is basically a 4-level grade separation and interchange. It will provide a 6 lane underpass for Airline Highway under the New Orleans Terminal Co. tracks, railroad bridges and service roads at grade. An intermediate level turning circle, set at track clearance, connected to the through highways by eight ramps, will accommodate all eight right-and-left-turn movements. A 4 lane overpass for Causeway Boulevard, extending from north of Metairie Road to south of the Illinois Central tracks, will provide grade separation over Metairie Road, the turning circle, Airline Highway and all tracks to the south.

Construction has not yet begun on the railroad bridges or the Airline Highway underpass, but the work is expected to start soon.

A "hook type" ramp provides interchange facilities at the intersection of Causeway Boulevard and Jefferson Highway. This is at present the southern terminus of Causeway Boulevard. Jefferson Highway (U. S. 90) is a heavily traveled interurban route, as well as the major approach to the western end of the Huey P. Long Bridge.

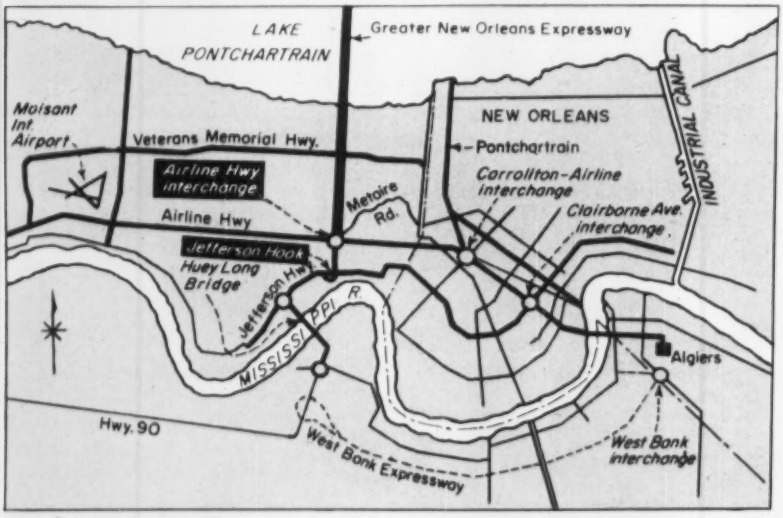
Traffic surveys revealed that a large number of left turn movements could be expected at this intersection. Therefore, the design chosen was the two-way ramp accommodating all left turn movements to and from Causeway Boulevard. Right turn movements are provided for at grade.

Design geometrics were chosen in order to minimize property acquisition necessary for right-of-way requirements. The ramp rises from grade at Causeway Boulevard, provides 15 ft minimum vertical clearance as it crosses Jefferson Highway, then swings to the west and returns to grade at the southern edge of Jefferson Highway.

• **Multiphase financing**—Complicated methods of financing have dictated construction priorities.

The Greater New Orleans Expressway Commission is providing the larger amount of funds for this project, under legal provisions that permit the use of expressway bond issue proceeds for constructing approach roads to the Greater New Orleans Expressway north of the south right-of-way line of Airline Highway. This includes portions of the Causeway Boulevard overpass, the turning circle and six of the connecting ramps.

South of the right-of-way line, financing is from a special state highway fund of $5 million and a $450,000 contribution by the railroads.



CONGESTION-BREAKER becoming a reality is the use of the Airline Interchange and the Jefferson Hook to accommodate a maximum number of turning movements daily.

Designed to Speed New Orleans Traffic

AIRLINE HIGHWAY INTERCHANGE—a basically four level grade separation, providing a six lane underpass for Airline Highway under the New Orleans Terminal Co. tracks, railroad bridges and service roads at grade.

The railroad bridges and the Airline Highway underpass will be financed by general state highway funds, with an additional $200,000 contribution from the railroads.

The varied sources of funds have required that the interchange construction be split into three stages. Stage one is the northern portion of the Causeway Boulevard overpass, the turning circle and six of the approach ramps; stage two, the two approach ramps, the overpass south of the south right-of-way line of Airline Highway and Jefferson Hook; stage three, Construction of the railroad bridges and the Airline Highway underpass. The fact that the underpass will be built last has necessitated modification in foundation design of the overpass and turning circle.

• **Foundation studies**—Subsoil investigations showed strata typical of the New Orleans area. Erratic stratifications of recent clay, silt, and sand, in various mixtures and deposits, were found overlying Pleistocene clays of good bearing capacity at depths of from 60 to 90 ft.

Cast-in-place piles were specified for the overpass, turning circle, approach ramps and Jefferson Hook construction. The contractor selected cast-in-place, tapered piles, with design loads of 35 tons. One of the test piles driven was given a load of twice the design load, and a second pile given three times the design load. The first had a gross settlement of $\frac{5}{8}$ in. in 24 hours, and a net settlement of $\frac{1}{4}$ in.; and the second had a gross settlement of $\frac{11}{16}$ in. and a net settlement of $\frac{3}{32}$. Average tip elevation for all piles was −90 ft.

All piles were driven vertically, with the exception of batter piles for each abutment. Footings were constructed of reinforced concrete and were supported by 4 to 22 piles.

Since the contractor for stage three construction (railroad bridges and Airline Highway underpass) will have limited headroom in some areas because of the turning circle and overpass, steel bearing piles will be used with sectional lengths determined by the amount of headroom available, in those areas where overhead clearance is obstructed. No test piles of this type have been driven to date. Where headroom is not limited, cast-in-place piles will be used.

• **Construction details**—All roadways are supported on bent piers founded on piles. Ramps are supported on single column hammerhead bents to achieve economy in cost and conserve space at grade.

The turning circle is normally supported by two-column bents, but at ramp intersections it was necessary to use bents with three or more columns. The overpass is normally supported by two-column bents. At lower levels, where the same bent is called upon to carry both ramp and overpass structures three or four-column bents are utilized.

Bents are all of reinforced concrete rigid frame construction having cylindrical columns. These columns vary in diameter, depending upon the design load, from 3 ft to 4½ ft.

Overpass roadways are supported on steel stringer spans, the normal span consisting of 10 stringers. Spans vary in length from 34½ ft to 75 ft. Skewed

70,000 words about 35-ton LORAIN Moto-Cranes

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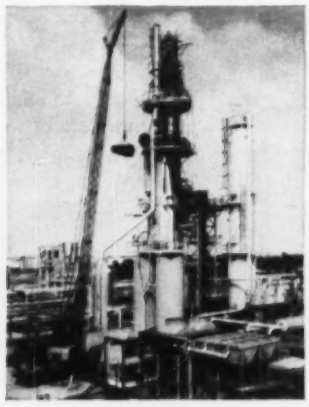

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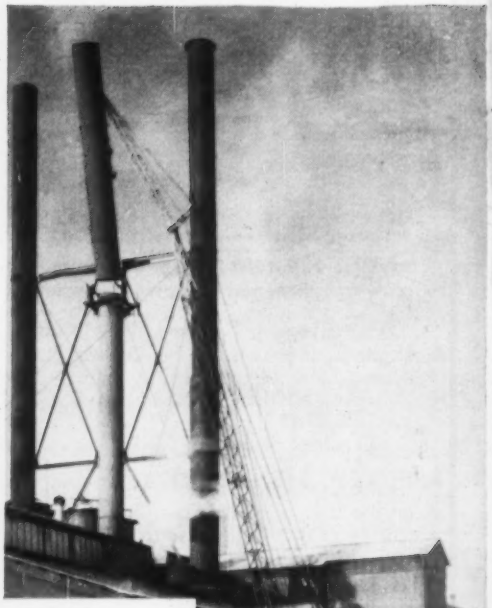

If a picture is worth 10,000 words, then here are volumes of testimony that Lorain 35-ton Moto-Cranes are on the job from coast to coast. These are only a few of the scores of Lorain MC-530W's working profitably for Lorain owners. The reasons are many. "Shear-Ball" mounting —Square-tubular-chord boom—2-lever, "Joy-Stick" air controls—and 8x4, 6x6, or 6x4 carriers are some of them.

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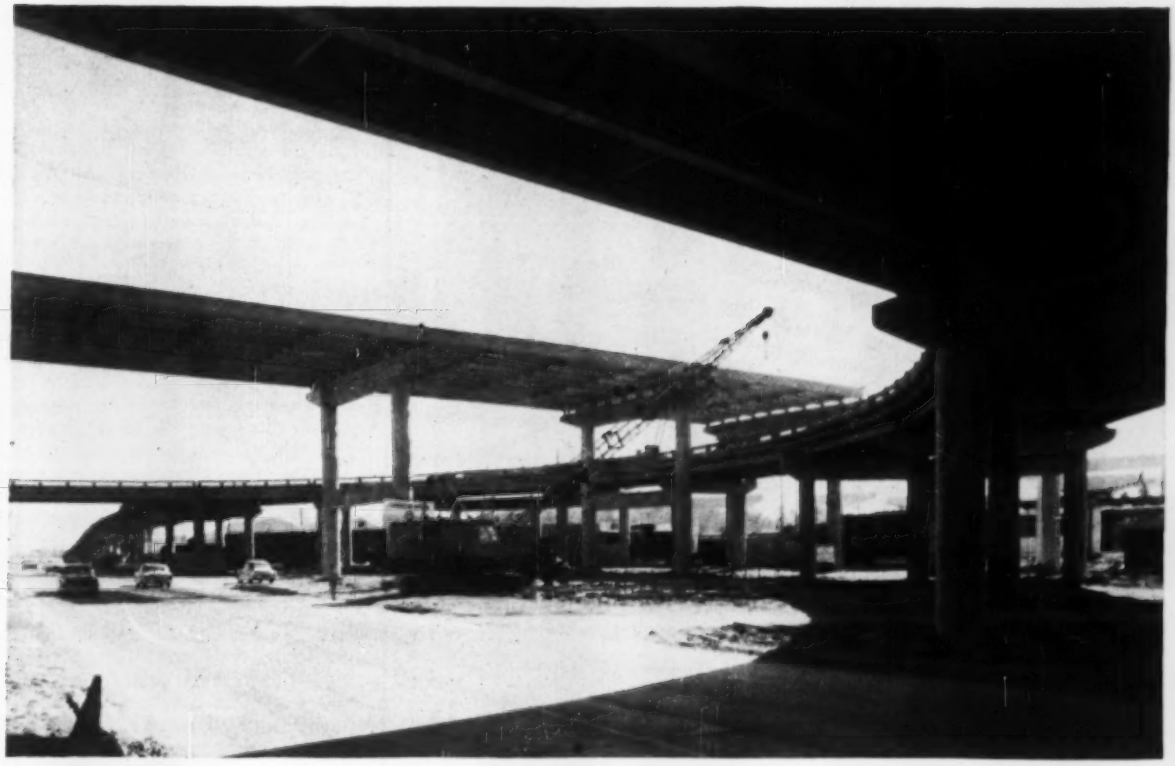


VIEW BENEATH the more than 350 ft dia turning circle shows overpass and turning circle construction methods.

spans exist on the north, to accommodate Metairie Road, and on the south over the railroads. There are 66 spans in the overpass structure.

The overpass has maximum ascending and decending grades of 5%, connected by an 850 ft long parabolic vertical curve, reaching a high point 52 ft above grade. There are two roadways, 28 ft wide with a 4 ft median divider. Safety curbs, 1½ ft wide, are provided on both sides of the roadway and throughout the entire interchange; roadway slabs are of reinforced concrete with a minimum thickness of six inches.

The turning circle has a 353 ft centerline diameter. As in the overpass, the roadway rests on steel stringer spans, varying from 38 ft to 70 ft in length. There are 20 spans in the circle, and normally there are six stringers per span. The design provides a 33 ft, 2-lane roadway, superelevated ¼ in. per ft to the outside. Design speed is 30 mph. Deck slabs and live loading requirements are similar to the overpass. This intermediate level turning circle averages about 31 ft above ground level.

The eight ramps connecting the turning circle to the through highways are basically similar in construction. Steel stringer spans support the 22 ft roadways. Spans vary from 38 ft to 75 ft in length, ramps have 6% and 7% descending grades. Right turn curves adjacent to the turning circle are depressed along the inside of the curves.

• **Geometrics pose problem**—A large problem arose because Airline Highway curves slightly to the south as it proceeds west at this point, complicating the already slightly skewed intersection. No two quadrants of the turning circle and ramps are thus geometrically identical. Radii of the right turn curves vary from 200.88 ft to 281.19 ft. Resolving the space geometrics into construction dimensions was a tedious and lengthy task.

• **Stage three construction**—Two parallel railroad bridges, each to carry two tracks, will span the Airline Highway Underpass. The two westerly tracks were moved 13 ft to one side, in order to provide space for bent footings of overhead structures.

The bridges, when built, will be the through plate-girder type with ballasted waterproof deck. Each bridge will have two 95 ft spans. The center pier of each bridge is located on the centerline of the 16 ft median divider of the underpass. Although the bridges span only the two 40 ft roadways and the median divider, the length used was determined by the skewed intersection the tracks make with the Airline Highway.

In order to keep the Airline underpass depth to a minimum, the bridge floor depth has been minimized by use of wide flange steel beams spaced approximately two feet apart. The floor of the bridges will be of corrosion resisting steel plate overlain by bituminous membrane and an asphaltic plank protective cover.

The underpass will be 1,624.82 ft long, grade point to grade point, and have a width of 106 ft inside the top of the retaining walls. A 16 ft median divider will separate the two 40 ft, 3 lane roadways.

• **Water problem**—Ground level at this site varies from plus two feet to plus five feet. Groundwater varies from plus three feet to minus three feet in elevation. This groundwater level necessitates special provisions against hydrostatic pressure acting upon the roadway and retaining walls.

A reinforced concrete slab having a maximum thickness of 15 in. will underlie the roadway, which will act as a continuous strut between the retaining wall and abutment footings. Longitu-

DRAFTING TRENDS

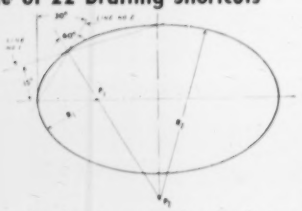
This free booklet, newly developed by the Frederick Post Company through the co-operation of leading engineers and draftsmen, shows 59 shortcuts to speed drafting and computation work.

Ideas for increasing drafting and engineering efficiency

POST went to leading engineers and draftsmen and asked them what techniques they use to save time without sacrificing precision in their work. From the many interesting tips and drafting shortcuts suggested, a total of 59 have been compiled into one handy booklet called "Time Saving Tips for the Draftsman and Engineer."

Clearly written and well illustrated, this booklet shows new approaches to old problems. The section on CALCULATING IDEAS contains 10 tips including easy ways of "Remembering the Signs of Trig Functions," "Dividing a Circle Into Parts," and "Locating Decimal Points."

One of 22 Drafting Shortcuts



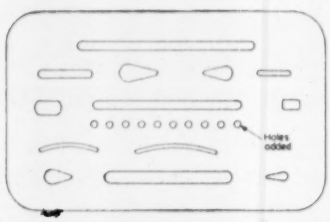
Here is what seems to be the fastest and easiest method of constructing an approximate ellipse: (1) Draw a line at 15° to major axis as shown. (2) Draw a line at 30° to minor axis as shown. (3) Draw a line at 60° to line #2 through intersection of lines #1 and #2. (4) Draw Arc R_1 from point P_1. (5) Draw Arc R_2 from point P_2.

9 tips in Engineering Data Section

Easy-to-use, practical shortcuts to formulas and other engineering data are featured in this section. Two of these time savers are faster methods of "Determining Gear Inertia" and "Interpolating Between Family of Curves."

One of 18 Board Timesavers

Fairly often when drafting it becomes necessary to change a solid line to a dotted line. By placing a series of holes in an erasing shield, as shown, it is possible to make the conversion simply by erasing through the holes.



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. . . Hook Ramp

dinal expansion joints will extend only through the wearing surface of the roadway.

To provide for subsurface drainage and to relieve hydrostatic uplift pressure on the roadway, cutoff steel sheet piling will be placed below the footings, and perforated concrete pipe, in a modified herringbone pattern, will be laid in a 12 in. bed of porous sand under the entire roadway. Provisions will be made for drainage from the back of the retaining walls. Surface drainage also is provided for by storm drains.

Both surface and subsurface water thus collected will be carried by a gravity drainage system to the pumphouse, on the south side of the underpass) which will be capable of discharging 17,000 gpm—adequate to keep the underpass dry during rains that reach a maximum intensity of 11 in. per hr.

• **Jefferson Hook**—The Jefferson Hook is basically a grade separation structure consisting of an elevated hook ramp—the centerline radius of the hook being 145 ft. The ramp has a symmetrical developed centerline profile, 6% approach grade connected by a 300 ft parabolic summit vertical curve, and 80 and 100 ft long vertical curves merging into the surface roadway grades. The ramp is 947.20 ft long, and affords minimum vertical clearance of 15 ft over Jefferson Highway.

As in the overpass construction, cast-in-place piles were used. These piles support rigid frame, reinforced concrete two-column bents. The 8 in. slab rests on 20 ft steel stringer spans, each span containing five stringers. The reinforced concrete roadway is 28 ft wide and is designed for AASHO loadings of H20-S16-44. Safety curbs, 1.5 ft wide, are provided on either side of the ramp. The roadway has a maximum super-elevation of 0.05 ft per ft.

All engineering, design, and subsoil investigations were done by Palmer & Baker, Inc., Consulting Engineers, New Orleans.

North of the south right-of-way line of Airline Highway, the Louisiana Paving Co. of Kenner, La., was awarded construction contracts for the Causeway Boulevard overpass, the turning circle and six approach ramps. South of this right-of-way line, structural steel work for the overpass and two approach ramps was awarded to the American Bridge Division of U. S. Steel Corp. Keller Construction Co. of New Orleans was the successful bidder for constructing the Jefferson Hook, while Louisiana Paving Co. was awarded the contract for extension of Causeway Boulevard at grade to the south.

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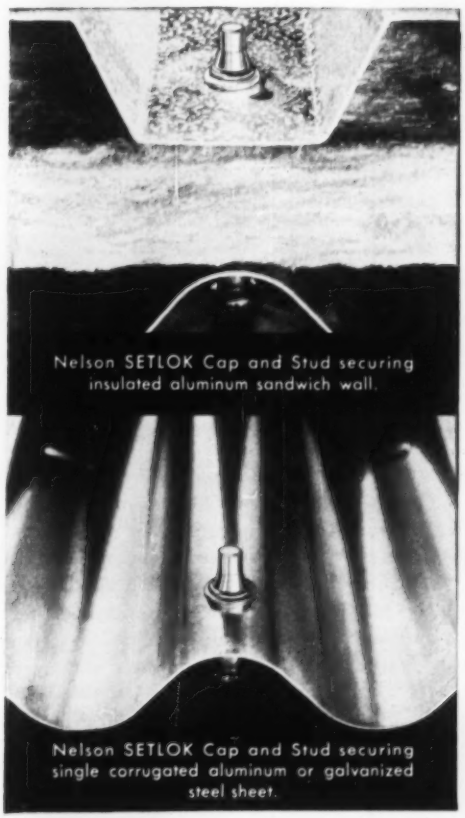

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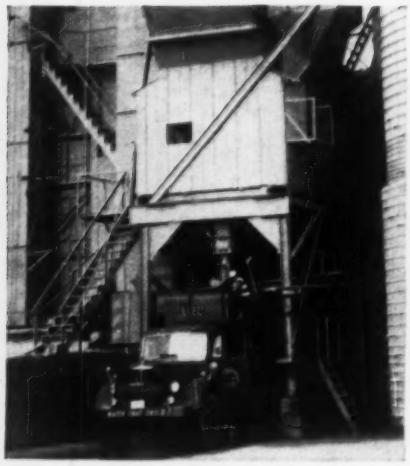


1 Ready-mix driver secures load at base nearest his most recent job. Radio tells him where to deliver load.

HOW ONE MAJOR CONTRACTOR CUT OPERATING COSTS WITH BENDIX DYNA-COM RADIO

Harry T. Campbell Sons' Corporation finds two-way radio boosts efficiency, eliminates delays

Two-way radio has brought about revolutionary changes in the construction business. And they're all to the good, according to Harry Campbell, Jr., of Harry T. Campbell Sons' Corporation, Baltimore, Md. The Campbell organization, a major construction and transit-mix company, has a national reputation as the largest manufacturer of Sakrete, a widely used brand of mix-it-yourself concrete.

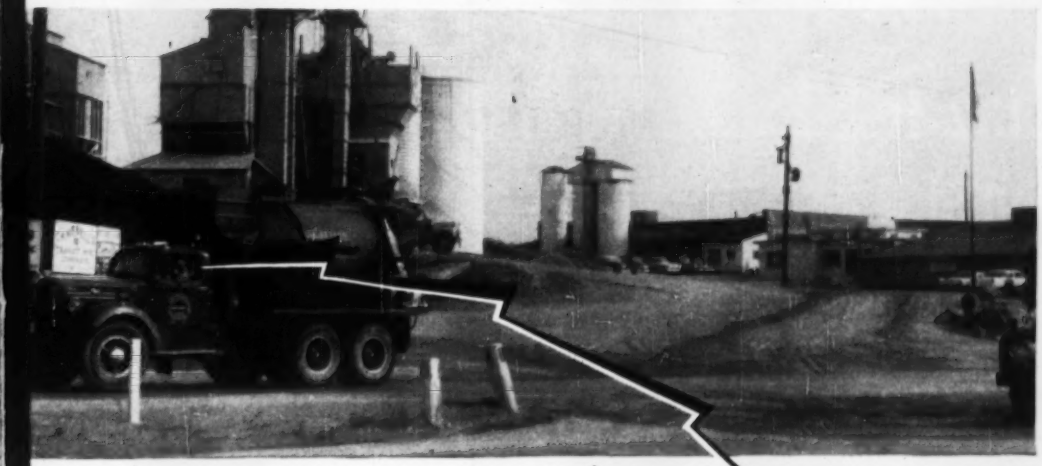
"The efficiency of our operation has really zoomed since we installed Bendix* Dyna-Com Two-Way Radio," says Mr. Campbell. "We've cut out this constant movement on the part of foremen and superintendents; they can spend more time where they're really needed! We've cut waste movement, and, what's more important, we've materially reduced operating costs. We wouldn't ever be without it again."

Of course, that's only a small part of the difference Bendix Two-Way Radio makes. As Mr. Campbell will happily testify, Bendix Radio is an absolute necessity where working sites are changed frequently, especially when they're at considerable distance from field headquarters. With Bendix Two-Way Radio every phase of the construction business is speeded up. Downtime is slashed to the absolute minimum. When a vehicle needs repairs, the necessary help can be on the way within minutes. It gives the dispatcher—and through him, the boss—absolute control of every phase of the operation. It almost literally enables him to be on the scene *at every spot* where work is being done, even on vast, sprawling dam jobs or highway projects extending over many miles.

In the ready-mix field Bendix Two-Way Radio is a must. When there is an over-supply at one location, a change in delivery schedule, a breakdown or a mired truck—the situation can be corrected immediately. There's no dumping of expensive loads, no costly chipping jobs . . . and no time-consuming search for a telephone.

Whatever your function in the construction or ready-mix field, you'll find that Bendix Two-Way Radio pays for itself within months. Write for further information. Our trained technicians will be glad to tell you how Bendix Dyna-Com Two-Way Radio can help make your operation more efficient.

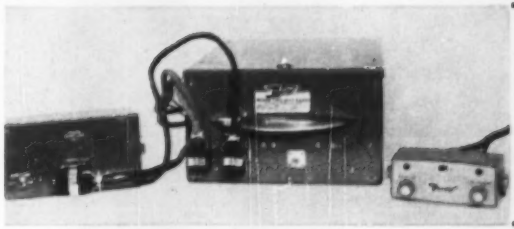
*REG. U.S. PAT. OFF.



2 Driver is on his way to job with load when he is reached by roving supervisor, who has recently visited job.

3 Supervisor tells driver there is no need for additional concrete at original destination, directs him to other nearby job.

4 Driver arrives on scene of new job, just at time concrete is needed. Long delay is eliminated by use of Bendix Two-Way Radio.



Bendix Quiet-Line unit, far left, can be plugged into any 25-54 mc. Dyna-Com Mobile unit. It banishes noise of crowded frequencies, shuts out all messages but yours. Provides optional tone-coded or conventional squelch operation.

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95-ft to 132-ft Pretensioned prestressed piles on 2 construction jobs...

...driven by McKIERNAN-TERRY PILE HAMMERS

The successful driving on 2 jobs of probably the longest pretensioned prestressed concrete piles ever used in the world has attracted particular attention to this type of pile for extra-length driving.

Ben C. Gerwick, Inc., was the contractor on both projects. In one case, 200 of the piles were driven between Piers 15 and 17 in San Francisco. The piles were 20-in. octagonal with an 11-in. hollow core, in lengths 95 to 132 ft with a design load of 60 tons each. All were driven down to grade with a McKiernan-Terry S10 Single-Acting Pile Hammer. The initial material was about 30 ft of rip-rap and rock fill, and Mr. Paul G. Morken, Vice President of Ben C. Gerwick, Inc., reports that "no difficulty was experienced penetrating this material and then obtaining the remaining full penetration required by the Harbor Board—thanks to the S10."

Piles of the same type, up to 105 ft in length, and totaling 11,700 linear ft, were driven about a month previously by Gerwick for the Eureka Slough Bridge on U. S. 101 north of Eureka, California, with equal success—typical of the results obtained by contractors all over the country in their use of McKiernan-Terry Pile Hammers to assure time-saving, cost-saving pile-driving jobs, whether special or routine.

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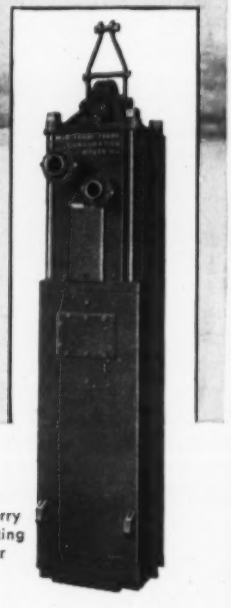

McKiernan-Terry S10 Single-Acting Pile Hammer

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The Texas Water Story: Lessons For All

Howard Jacoby
Associate Editor

For some years now the water problems of Texas have had an uncommon attraction to observers all across the country. Perhaps some of this attraction stems from their seeing a proud and affluent state groping its way like any other neophyte. But the more likely reason for interest is that, except for California and perhaps Pennsylvania, Texas has penetrated the water resource question deeper than any other state. And Texas' problems are more akin to those in most other states.

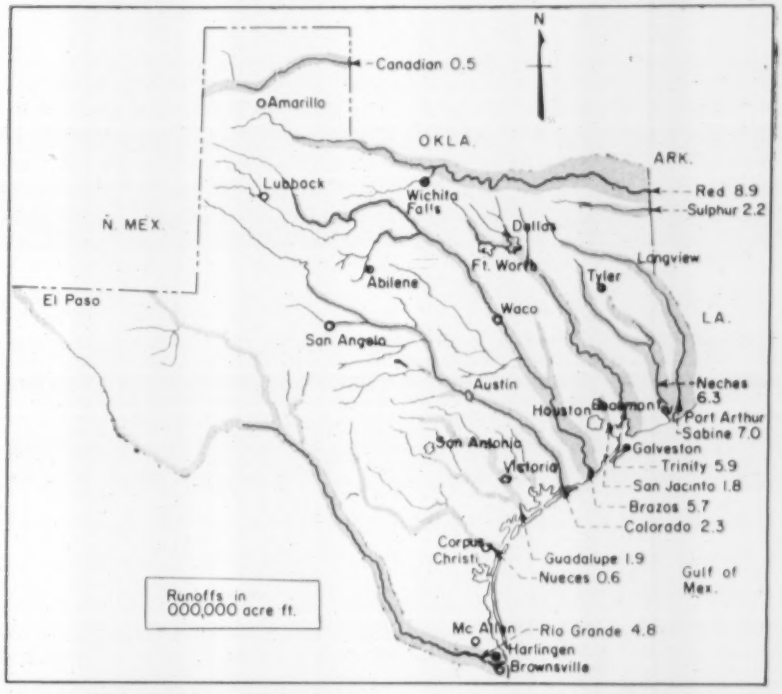
The much publicized 7-year drought over Texas and the rest of the Southwest did not cause Texas' water problems, nor does its recent end solve them; the drought merely brought them to a head and spurred a rash of planning and project building. While water use increased 2½ times since 1940, the drought sharply curtailed available supplies and 75% of the people of Texas were forced to restrict, to some extent, their use of water during one time or another.

But when Texans awoke to their plight, some time near the beginning of the drought, they found that reservoirs could not be built like the famous Texas oil deals are made—on a handshake. Basic hydrologic, topographic and geologic data were woefully short; cities and river authorities lacked financial ability; rampant conflicts over water rights deterred many projects; and the state lacked a most necessary—for Texas—over-all water development plan.

In spite of these handicaps, the cities and the many river authorities of Texas have in the last few years succeeded in getting under way and making fairly firm plans for a surprisingly large number of projects as shown in the accompanying city-by-city summary. In the view of some Texas water experts, progress in the municipal water supply area is eminently satisfactory except for a few cities along the Rio Grande and perhaps San Antonio which is experiencing difficulty obtaining necessary out-of-basin water rights.

By far the more critical problems are in obtaining water for industry and agriculture. While water requirements of the cities include much for industrial use, they do not include the water to attract such large users as the petroleum, chemical and metallurgical industries which usually draw their own supplies.

These industries that Texas hopes to continue to attract will settle predominantly in the eastern part (up to and including Corpus Christi) of the Gulf Coast area, an 80 mile swath extending 400 miles from Port Arthur to Brownsville. This area is abundant in natural resources and in navigation facilities. But it is in this area that irrigation from surface water sources is heaviest. And irrigators usually have prior claim on the "normal" stream flow, based on early riparian rights and subsequent "certified filings".



RIVERS FLOW TO THE GULF COAST where industries—such as petroleum, chemical and metallurgical—contend with agriculture for water.

The interaction of industry and irrigation here is the crux of the Texas water problem right now. Its solution requires sturdy action along the four fronts mentioned earlier: water rights, basic data, master planning, and financing procedures. Planning is particularly important, for the reservoirs to serve this area will have to be built farther up the rivers, and in many cases on the same rivers serving the populous cities to the north.

The eastern Gulf Coast is, of course, not the only problem area in the state. For years irrigators along the Rio Grande River have been vying—and successfully—with municipalities for water. Several years ago the courts had to appoint a master to assure that cities were left sufficient water to meet their existing needs. The lower Rio Grande area would also be eminently suited for heavy industry if water could be provided.

In the other parts of Texas, water problems are not as complex. The cities and authorities, even in the arid western part of the state, are dong very well in assuring municipal supplies, facing difficulties mainly in long-range planning and financing. Irrigators, concentrated in the panhandle area and in the southwest corner of the state, appear to be fighting a losing battle against ever-lowering groundwater tables. However, even here better understanding of groundwater, obtained through acquisition of basic data, will be very helpful.

• **Water rights**—Texas is presently suffering under a peculiar conglomeration of riparian and appropriative rights laws. Although complex, they constitute a model in one respect: As an example for study by the many eastern states considering superimposing some sort of an appropriate doctrine over existing riparian laws.

Texas started out in 1845 under the riparian principle, modified through Spanish and Mexican influence to include use of water for irrigation. In answer to demands by non-riparians (irrigators mainly), in 1889 the state enacted an appropriative law under the first in time, first in right rule. An appropriator merely had to file his intention to divert. The rights of ripar-

. . . Water rights confused, basic data lacking

ians to "reasonable use" were not curtailed then, nor have they been either curtailed or defined to this day.

Development of high capacity irrigation pumps near the turn of the century bred subsequent disputes, so in 1913 the State Board of Water Engineers was created to control all new appropriations of water through permits. Pre-1913 appropriators had to file with the board copies of their appropriation statements recorded and certified to by county clerks' offices, hence the common term "certified filings".

The one limit on riparian use was an opinion by the State Supreme Court that riparian rights exist only in the "ordinary flow and underflow" of watercourses and that "storm and flood" waters are set aside for appropriation. However, such division of waters in a stream is most difficult, if not impossible, to determine.

Thus, today Texas is confronted by a most confusing quantitative water situation. The Board of Water Engineers has on file permits granting the consumptive use of 27 million acre-ft (maf) of water (another 8 maf for hydro use) while only 9 maf of this is actually used. Then there is the undetermined usage by riparians, which also threatens the appropriative users.

Some streams are already over appropriated. Although an average of 38 maf of surface water available to Texas drains to the sea each year, in drought years as little as 15 maf is available (the generally quoted 53 and 20 maf runoff figures have been reduced by the amounts belonging to adjacent states from common streams such as the Red and Sabine Rivers). So new permit issuance for direct diversion from some rivers is at a standstill until the rights question can be resolved.

Two years ago a first step was taken by the state legislature, in requiring both appropriators and riparians to file annual use reports for all purposes except domestic and stock watering. This year, the legislature authorized the Board of Water Engineers to cancel unused portions of existing permits and of most certified filings—those held by municipalities are exempt.

Several years ago the legislature also took what most engineers consider a backward step in allowing a landowner to impound 200 acre-ft of water in any one reservoir "for domestic and stock needs" without a permit from the state. There are a lot of landowners in Texas and each can build any number of reservoirs.

As in many other states, Texas law has virtually no provision for groundwater control—the water belongs to the property owner no matter what he may do to his neighbor's water table. The incidents of Comal Springs, between San Antonio and Austin, and Commanche Springs in west Texas, are famous in the state. Both were once dependable water sources, developed with sizable investments, and now seriously depleted due to upstream well developments that pumped underground sources dry.

Major problems facing Texas in the rights area then, are defining (and perhaps limiting) riparian rights, the more normal difficulty of introducing additional flexibility into the appropriative doctrine so that priority of use can modify "first in time", and enacting some form of groundwater control. Present Texas law does place water for industry ahead of irrigation in priority, but this has little effect on riparian irrigators.

• Basic data—The confused rights situation notwithstanding, a fair degree of progress can be made in many areas of the state where irrigation is minimal and water relatively plentiful. Texas' most critical water problem is basic data: hydrologic, topographic and geologic.

Texas' expenditure of some $500,000 a year toward this end is paltry compared to the $5 million spent by California. In cooperation with the U. S. Geological Survey, the Board of Water Engineers is operating only 275 stream gaging stations over the entire 254-county, 267,000 sq mi area of Texas. The very important 9,000 sq mi Sabine River basin is served by only 17 gaging stations, more than 10 with records of less than 15 years duration. Although much of the future water development will be on tributaries, gaging data are most seriously lacking here. In the words of R. M. Dixon, chairman of BWE, "the state highway department will in the next 10 to 20 years rebuild many of its bridges (over streams). Perhaps Texas is not willing to provide the money required to collect necessary hydrologic data, but it is nevertheless being paid out now in bridges that are underdesigned or over-designed."

Information on groundwater is extremely short; in 100 of Texas' 257 counties, no basic data are available. There is little understanding of the inter-relationship between ground and surface waters (a better understanding could have prevented substantial financial losses at Comal and Commanche Springs through abandonment of substantial equipment).

The state also has no topographic mapping program to determine reservoir location and extent of feasible impoundments.

However, there are some signs of an awakening. For 1957, BWE had its budget increased 80%, to $450,000, but next year's appropriation just decided by the state legislature is only $475,000 plus $50,000 for watershed planning if authorized by general referendum in November. Unfortunately, BWE's request for topographic mapping funds—to match USGS—were again denied by the state legislature.

At lower governmental and private levels, there are several significant projects involving basic data under way or nearly so.

The cities of Dallas and Fort Worth have each put up $20,000, to be matched by USGS, for a gaging program on the upper Trinity River to determine the effect on surface runoff of the Soil Conservation Service's small watershed program.

The Brazos River Authority now is considering a dam on Dove Creek to create an evaporative pond for that tributary's highly mineralized (500 ppm of chlorides) waters.

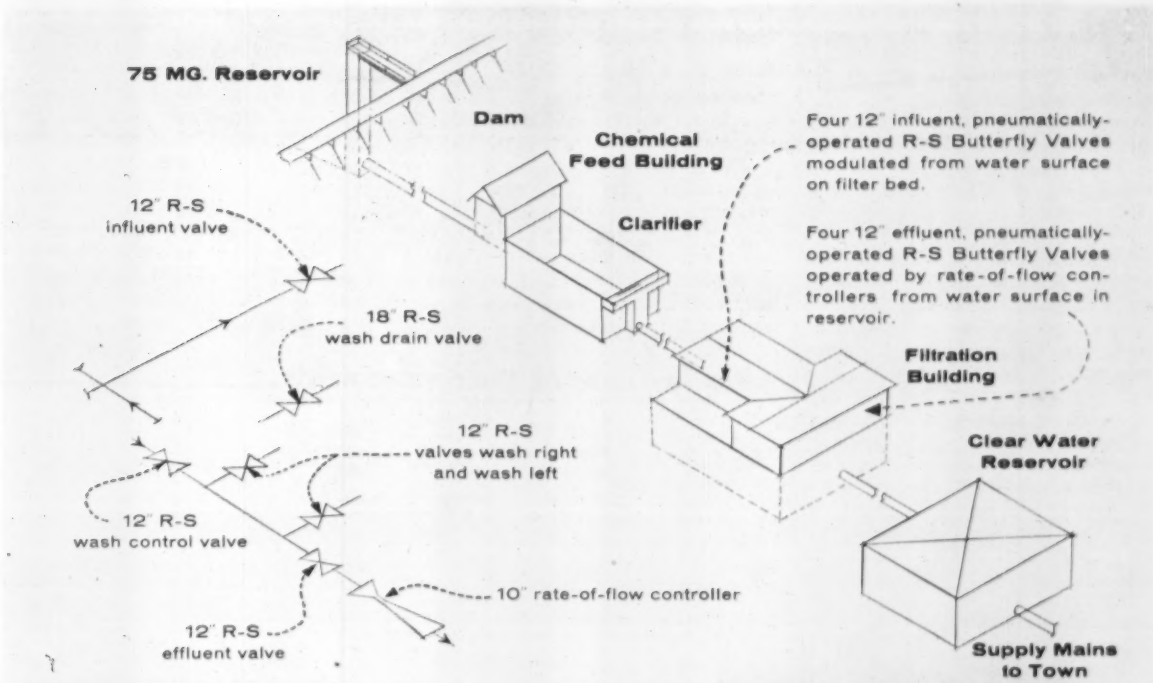
Former BWE chairman E. V. Spence of Big Spring has raised $25,000 by public subscription to finance experiments at Southwest Research Institute, San Antonio, on reduction of evaporation from lake surfaces (ENR May 17, 1956 p. 106). Texas Electric Service Co., in conjunction with Ionics, Inc., Cambridge, Mass., is experimenting on demineralizing brackish water by the electric membrane process (ENR Feb. 14, p. 59); at Wichita Falls, on a tributary of the chloride-heavy Red River.

And on reuse of sewage effluent, Amarillo last year completed an activated sludge plant whose effluent is sold to an oil refinery. Odessa plans a similar plant, whose effluent will be sold to a new rubber manufacturing factory.

• Master planning—The current water sequitur that if future water demand is not first provided for, the demand will never materialize, is nowhere more true than in Texas. Its limited water resources and confused rights situation are even now a deterrent to new industry and to existing industry.

Texas water experts generally look to the Board of Water Engineers to spearhead development of master plans, both by doing its own planning and by requiring and reviewing over-all plans by the various river authorities. BWE, however, has no funds for such planning except the small amount it may get in November. And if it had, its work would still be somewhat stymied by lack of basic data.

River authorities and smaller water conservation districts are doing some planning, but scope is generally narrow and the planning often lacks coordination with groundwater, with other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Clarifier
12" R-S influent valve
18" R-S wash drain valve
12" R-S valves wash right and wash left
12" R-S wash control valve
10" rate-of-flow controller
12" R-S effluent valve
Four 12" influent, pneumatically-operated R-S Butterfly Valves modulated from water surface on filter bed.
Four 12" effluent, pneumatically-operated R-S Butterfly Valves operated by rate-of-flow controllers from water surface in reservoir.
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Clear Water Reservoir
Supply Mains to Town

Diagrams of Durango Plant from sketches by Dale H. Rea, Consulting Engineer, Littleton, Colo., designer of the plant.

R-S Butterfly Valves used exclusively at Durango, Colorado,

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Durango, Colorado's 8.7 mgd water treatment plant operates automatically. But accurate flow control is necessary in this gravity system if the proper rate of flow in the treatment process is to be maintained. R-S Rubber-Seated Butterfly Valves were chosen to do this job. Their angle seating provides more desirable control characteristics. It means *more precise regulation over a greater range* than is available with 90° seated valves. 25 R-S Rubber-Seated Butterfly Valves, ranging from 12" to 18" in size, are installed here.

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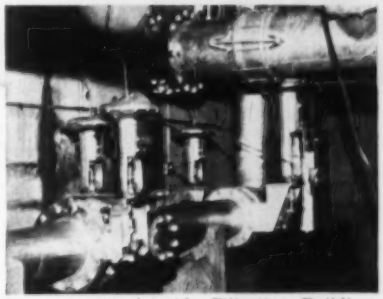

Compact piping inside Filtration Building shows rate-of-flow controller in left foreground, with wash and wash control valves behind it. This arrangement is diagrammed at left, above.

Two settling basins feed to Filtration Building in this 8.7 mgd system.

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3

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. . . No love for the heavy federal hand

basins and sometimes among all the single basin uses of water.

Some Texas water men accuse the Corps of Engineers of wastage of valuable reservoir sites by single purpose concentration on flood control. But master planning has not progressed far enough to enable a judgment of this charge, and it should be noted that the Corps was restricted in its outlook by federal legislation confining provision of water supply storage space in reservoirs to meeting then existing requirements only. It is to be expected that the Corps' outlook will broaden with the imminent passage of legislation granting authority for it to plan for future water supply and to provide low-flow stream regulation. (Indeed, some water experts all over the country are fearful that this legislation—passed last year as part of a bill vetoed by the President—puts the federal government squarely into the water supply and stream pollution fields).

However, the standing of the Corps is fairly high in Texas compared to that of the Bureau of Reclamation. A good many Texans feel Reclamation is just aching to get a large project started in the state (it has none now) regardless of whether it meets Texas' requirements. The feeling has developed to the point where many local engineers state privately they have no confidence in Reclamation's grandiose $1.1 billion plan—made at the behest of Senate Majority Leader Lyndon Johnson—to impound east Texas waters and move them via a canal to the arid western part of the Gulf Coast strip (ENR July 23, 1953, p. 24).

Texas water engineers, politicians and other community leaders appear to be solidly against the plan. The main reason cited by engineers is that whereas irrigation would utilize over 80% of the transmitted water and hence prompt approximately this percentage of the cost, irrigation's benefits amount to only 7% of the total benefits. In short, municipal and industrial users would be subsidizing irrigators. Therefore, reason these Texans, the Johnson Plan as it came to be known, was not conceived primarily to meet the real need of Texas which is water for industry first. Another objection is that Reclamation failed to consider sufficiently long term water needs in the upper reaches of the eastern streams; some Texas engineers feel there will be very little water available for irrigation south of Corpus Christi.

Opposition of politicians and community leaders appears based on general antagonism to anything involving federal implication. It should be noted that few water engineers go around saying in public that water for irrigation must be secondary to water for industry. As yet, this fact of life is politically unpopular.

The foregoing paragraphs give some of the reasons why a great many Texans are suspicious and even distrustful of federal water agencies. These feelings are reflected in many water planning documents which either ignore, or seem to go out of their way to criticize, the work of federal agencies.

But some few Texas water engineers at present believe this attitude may be akin to cutting off one's nose to spite the face. For example, regardless of the merits of Reclamation's grand plan, Reclamation's analysis of all of Texas water resources and problems, which accompanied the plan, represents the most astute analysis of the total picture yet made, in the view of some frank local experts. It would be a great waste indeed, they believe, if such valuable thinking were cast aside for somewhat emotional reasons.

Cities are meeting their water needs

City Source	Population Served (000) Present 1975 2000	Average Water Demand (mgd) Present 1975 2000	Safe Yield (mgd) Present Existing rights	Current development plans
Abilene 3 reservoirs	75 180[1]	11.7 35[1]	28.5 Suff[2]	$12-million res on Hubbard Creek to be built by West Texas Munic. Water Dist. to supply foreseeable needs.
Amarillo 80 wells	125 220	17.6 39	54 104	City has purchased 125,000 acres of water rights in adjoining counties. Has completed 10 new wells of 15 mdg cap and 25 mi of transmission main of 50 mgd cap.
Austin Colorado R.	197 417 1,200	33 58 180	80 Suff	Run of river supply firmed up by releases from 6-dam development of Lower Colo. R. Auth. Present storage cap sufficient for year 2000.
Beaumont Neches R.	110 250	11 33	25 130	Voters recently approved $6.7 million bond issue to expand system; plans being prepared.
Brownsville Rio Grande	50	8.3	20 20	No plans.
Bryan 10 wells	30 45	4 6	8.2 Suff	Plan to drill 2 more wells soon with money on hand. Existing well field reserves believed able to meet all future demands.
Corpus Christi Nueces R. & 10 wells	185 420	45 123	78 300	$15.5 million dam on Nueces R. 85% complete, will provide 134 mgd safe yield. Will increase height for 300 mgd yield under $60 million program incl trans and distr storage.
Dallas Trinity R.	600 1,100 2,300	80 200 465	126 Suff	$45 million Iron Bridge Res. on Sabine R. (in land purchase stage) to yield 178 mgd. Plan $60 million further devel of Trinity R. to meet 2000 demand.
El Paso Wells	203 260 300	26 75 120	Suff Suff	Has $40 million plan for recharge and expansion of present well fields, two new fields and storage of mountain surface water.
Fort Worth Trinity R.	374 1,000 1,720	50 200 344	81 410	Plan $82.5 million expenditure thru 1975; $46 million thru 2000 to develop 329 mgd of Trinity R. sources. May secure another 250 mgd of rights in federally auth Boswell Res. in Okla.
Galveston 12 wells	72 86 100	11 15 22	14.3 NA[4]	No plans. Existing well field can supply most of foreseeable need.
Greenville Sabine R.	20 33 50	2 7.5 15	2.5 8.3	Consultants are investigating 5.8 mgd of upstream storage on Sabine R., also possibility of obtaining 15 mgd from Sabine River Auth.
Harlingen Rio Grande, wells	35 73	7 26	12 NA	No plans.
Houston Wells, San Jacinto R.	700 2,500	251 670	350 approx NA	Plan to finance additional surface supply this year, probably dam on San Jacinto R.
Longview Sabine R.	50 75 125	6 19 30	10 24	Work will soon be under way on 2nd res. on Big Sandy Creek (trib of Sabine), to yield 14 mgd.

• **Organization and financing**—Connected to some degree with the widespread attitude toward big government is the total lack of proposals in Texas that even hint at state construction of any water facility. Leave it to the lowest governmental level is the oft-heard cry. And again a few thoughtful Texans are wondering if this isn't too much of a good thing, whether a balanced state and local construction plan like California's would be desirable.

However, Texans are only just beginning to think in terms of inter-basin transfer of water; a more active state role may yet grow out of this.

Texas engineers and the general public have a profound respect for their state highway organization, the heavy federal participation notwithstanding. At the second annual conference on "Water for Texas" convened by Texas A. & M. College, Gibb Gilchrist, a leading water engineer and former state highway engineer, came out with characteristic Texan vigor for a water organization patterned after the state highway department. One board, operating through districts, would draw up a comprehensive plan. Mr. Gilchrist didn't carry his analogy into actual construction. The data gathering and planning would be financed by an ad valorem tax. Subsequent construction would be financed by a water use charge, to be paid by all who draw from streams and the ground.

Nothing as extreme as Mr. Gilchrist's proposals are in the immediate offing. But this year's state legislature did take one notable step in authorizing a $200 million state bond issue, the funds to be used to purchase bonds of local water agencies which could not sell them elsewhere at reasonable interest rates. (ENR June 13, p. 166). The state issue has to be submitted for general referendum in November.

The recently ended state legislative session was also notable for its passage of nine of 18 bills having to do with water, a high percentage for Texas. Although many of new laws were watered down from original engineers' proposals, the legislature's performance was reassurance to water men that the general public has not forgotten the lessons of the drought and had made known its wishes to its representatives.

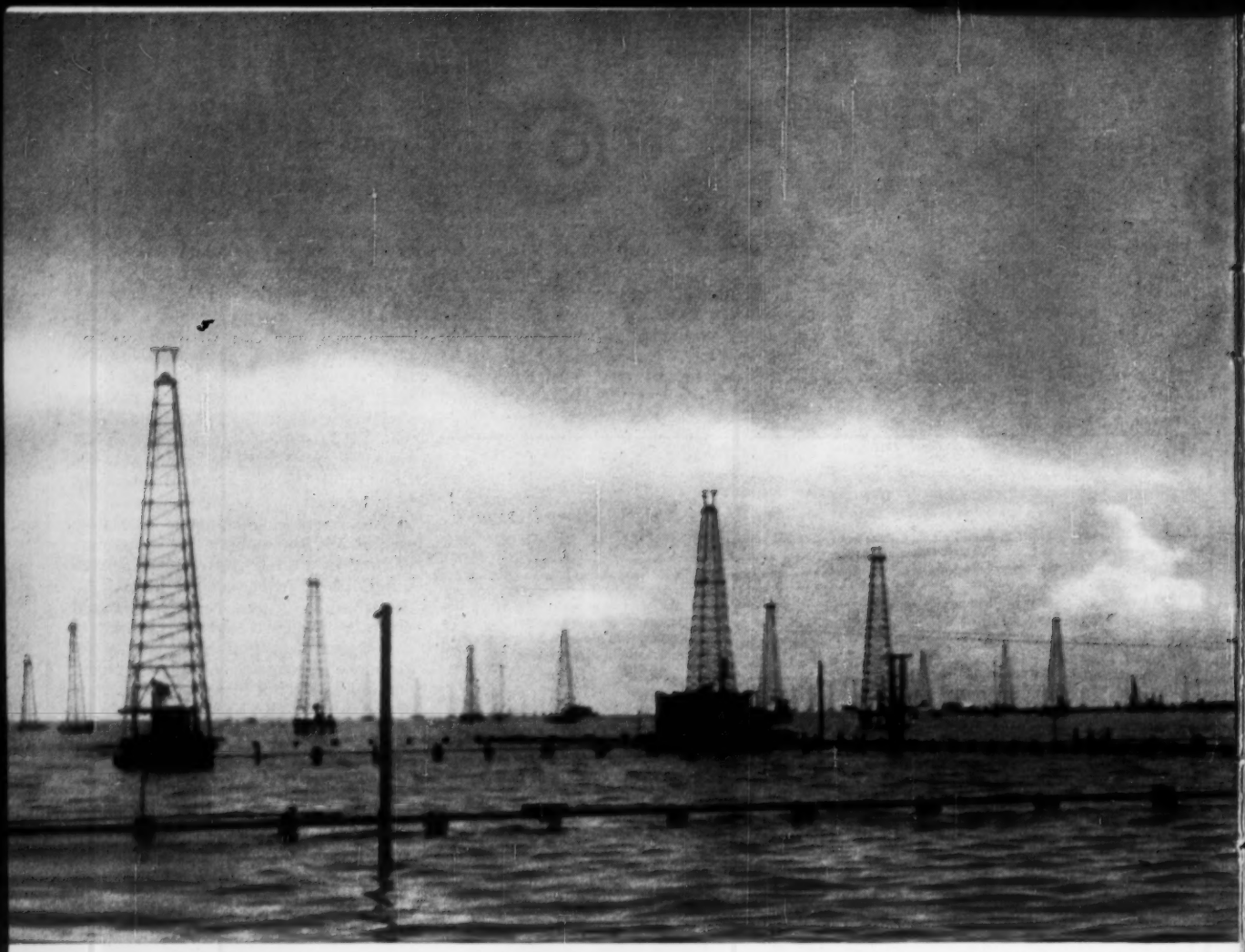
• **Where heading**—While the foregoing picture of the Texas water situation may indicate that more problems lay ahead than behind, two solid accomplishments stand out. One is that the people of Texas, who must pay the water resources construction bill, have been convinced of the importance of taking action on the state's water problems. The second is that professional engineers, perhaps more so than in any other state, have taken the lead in so convincing the public.

The Texas Section of the American Society of Civil Engineers and the Texas Society of Professional Engineers have gotten out handsome brochures on water policy. Leading engineers, men such as Marvin Nichols of Fort Worth, James Cotton and T. Carl Forrest of Dallas, E. N. Noyes of Corpus Christi, Mason Lockwood of Houston, the redoubtable Messrs. Dixon and Gilchrist, and a host of others have gotten down to the grass roots level to plead their cause. Frequently they take part in discussions and interviews that receive wide publicity in local newspapers, radio and television. Their activity as advisors at higher governmental levels, particularly as members of the legislative advisory Texas Water Resources Committee, has also been quite effective.

These accomplishments, recent stirrings by the state legislature and the raft of current and planned projects lend credence to the firm belief of most Texans that Texas will have its water when it needs it.

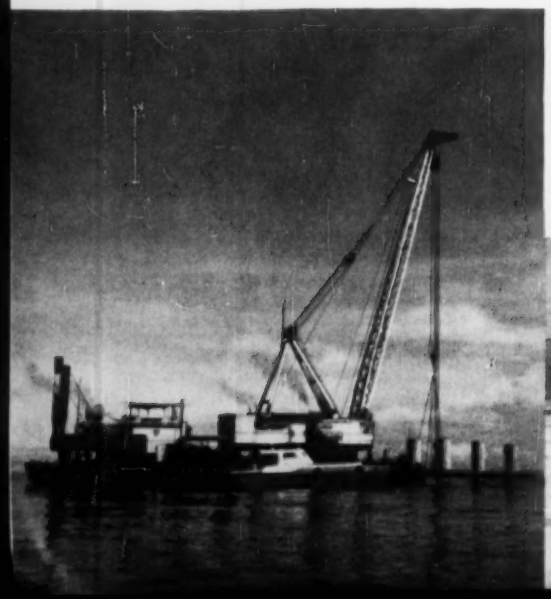
City Source	Population Served (000) Present 1975 2000	Average Water Demand (mgd) Present 1975 2000	Safe Yield (mgd) Present Existing rights	Current development plans
Lubbock 109 wells	130 250 530	16 33 76	38 Suff	1st phase of new well field 70 mi distant is near completion; this supply in conjunction with planned 8-city Canadian R. project would assure supply thru 2000.
McAllen Rio Grande	28 45 ——	3.5 6 ——	6 NA	No plans.
Midland wells	47 —— ——	4 —— ——	18 18	Consultant now preparing needs report. City negotiating with Colo. R. Munic. Water Dist. for addit'l water from Lake J. B. Thomas.
Palestine 4 wells	15 25 45	1.5 3.5 8	5 Suff	Has contracted to buy water from Upper Neches R. Authority's $6.5 million 175 mgd Blackburn Crossing Res. now in land purchase stage. Jacksonville and Rusk also participating.
Port Arthur Neches R.	80 100 ——	6 8 ——	8.5 100	No plans.
San Angelo Concho R.	70 125 160	10 21 26	15 Suff	Acquired 80,000 acre-ft of storage in San Angelo Res. on Concho R. (trib of Colo. R.) of which 10 mgd now developed.
San Antonio Wells	518 800 1,195	156 205 270	NA NA	Groundwater supply subject to depletion by irrigators. City plans purchase for $34 million of 90 mgd of storage in authorized Canyon Res. on Guadalupe R. City looks to Colo. R. for 180 mgd supply, is having difficulty securing permits.
Temple Leon R., wells	32 54 132	4.4 12 21	8 8	City negotiating with Brazos River Auth. for storage and releases from Belton Res. which would supply all anticipated growth.
Tyler Neches R., wells	55 80 125	7.5 17 30	15 32+	Plan construction of new 17 mgd res. on Prairie Creek. Existing well field can also supply more water.
Victoria wells	40 90 ——	4 9 ——	Suff Suff	Existing facilities can meet 1960 demand. No firm plans beyond but sufficient groundwater is available to meet foreseeable need.
Waco Bosque R., Brazos R.	110 230 500	15 37 80	30 Suff	Ample supply of doubtful quality available from Brazos R. High quality supply from Bosque R. res. (trib to Brazos) will be increased by proposed federal dam.
Wichita Falls Little Wichita R.	120 200 400	12 25 50	20 Suff	Has permit to impound 433,000 acre-ft in planned 2nd res on Little Wichita R. (trib to Red R.).

Notes:
1. 1980 estimate.
2. Suff = sufficient for year 2000.
3. —— = not yet estimated.
4. NA = information not available or unobtainable.



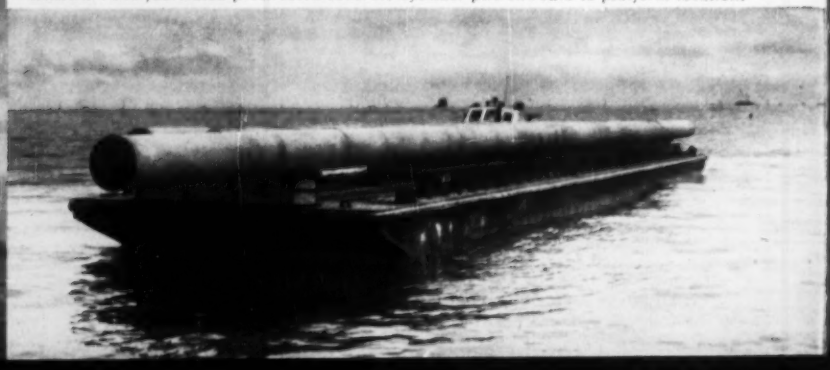
RAYMOND'S important role

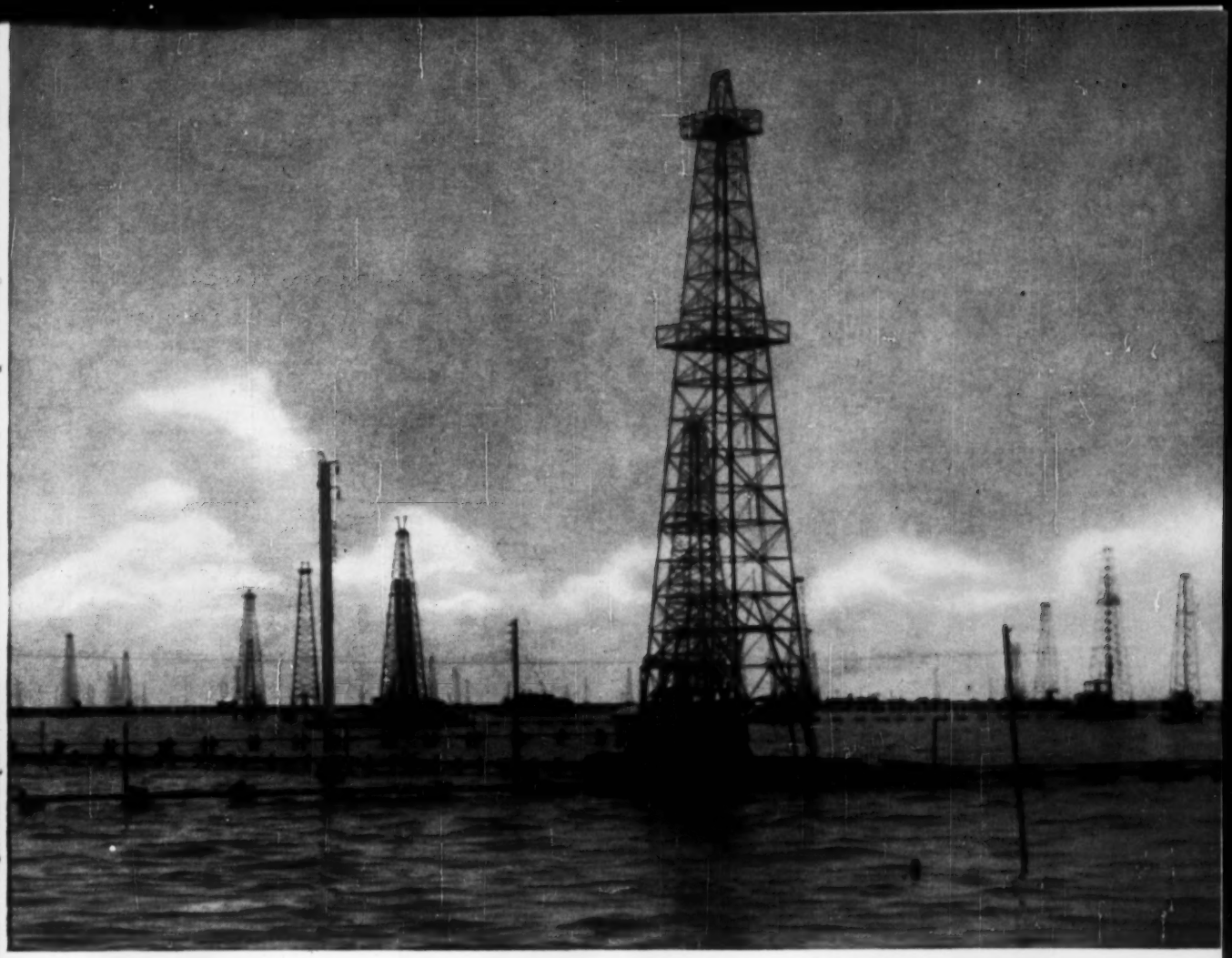
Development of Prestressed Concrete Cylinder Piles a boon to oil companies on Lake Maracaibo



LEFT: Giant floating rig in action at job site.

BELOW: Pre-fabricated prestressed concrete cylinder pile en route to platform location.





in the great "Oil Rush" of '57

Not since the days of Spindle Top has the world seen such an oil boom! At Lake Maracaibo, Venezuela, offshore rigs are springing up in amazing numbers, and the swish and thump of pile drivers fill the air. At this impressive, industrious exploration and drilling site, such oil giants as Shell, Mene Grande, Signal, Superior, Sun and San Jacinto have turned to Raymond to provide derrick platform foundations. The reason: Raymond's revolutionary Prestressed Concrete Cylinder Pile. This, the latest foundation development in our 60 year history, assures complete protection against the corrosive properties of Lake Maracaibo. In addition, Raymond Cylinder Piles offer greater structural strength, increased load capacities and longer life. And, thanks to a unique assembly line process, the manufacturing of cylinder piles at the job site saves time and money.

Raymond Cylinder Piles are manufactured in a series of sections placed end-to-end, which are joined by post-tensioned cables of high tensile steel wire. The sections are then grouted to form a homogeneous, impervious support of extraordinary strength and durability. To meet the demands of the new contracts, we are expanding our cylinder pile manufacturing yard, which is located right at the job site. When completed, this yard will be the largest of its type in the world!

For over 50 years, Raymond has served the oil industry, and since 1926, we have maintained a permanent office in Venezuela. You will find Raymond foundations supporting offshore drilling rigs, tanker wharves, cat-crackers and storage tanks just about everywhere oil is drilled and refined. May we also serve you?

FOUNDATIONS FOR THE STRUCTURES OF AMERICA... COMPLETE CONSTRUCTION SERVICES ABROAD

AROUND THE WORLD FOUNDED 1897

RAYMOND Concrete Pile Co.

140 CEDAR STREET, NEW YORK 6, N. Y.

Branch Offices in Principal Cities of the United States. Subsidiaries in Canada, Latin America and other countries.

OUR 60th YEAR

The 110'6" debutanizer shown above and the 150-ton unit (below), a 3-stage axial flow compressor, are typical Newport News products. Whether you need a hydraulic turbine, vacuum tanks or penstocks . . . bridge caissons, digesters or dryer rolls . . . you can command the services of Newport News for units of about any size or shape.

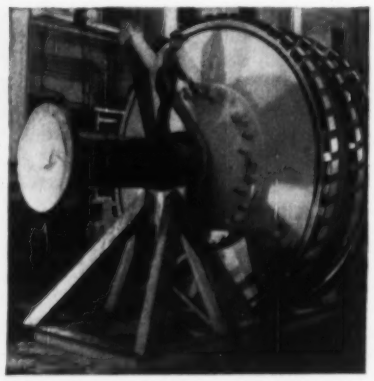
Newport News builds wide variety of large units

ALMOST ANY TYPE of heavy equipment can be built by Newport News.

And the reason? Specialized production techniques for one thing. You get the benefit of plant methods and equipment developed as a result of Newport News' seven decades of experience. Seven decades fabricating millions of tons of steel . . . carbon, corrosion-resistant alloy, clad and other special steels.

Moreover, Newport News' plant provides unsurpassed facilities. More than 225 acres in area, it comprises vast steel fabricating shops, five huge machine shops, acres of pattern shops and foundries. It includes forge and die shops, heat treating furnaces and allied equipment, along with complete modern test apparatus.

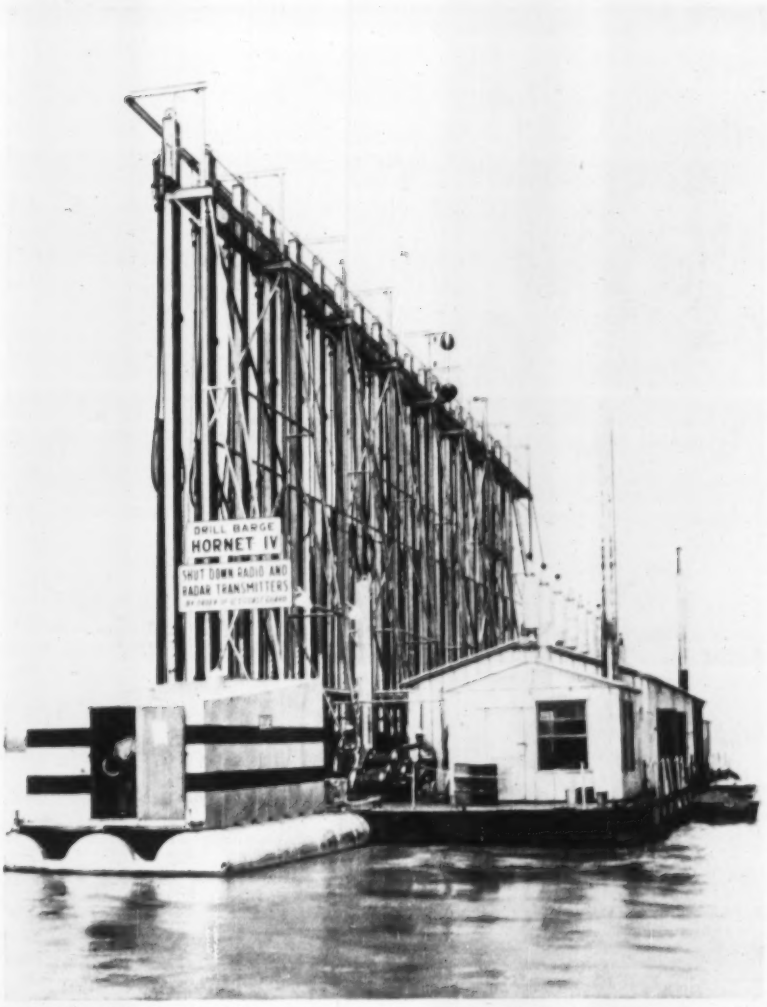
But most important of all . . . it is the high integration of skill and production facilities that enables Newport News to build large units fast . . . to save valuable time. Let us bid on your present or future projects. Write today for your copy of our illustrated booklet "Facilities and Products."



Engineers — Desirable positions available at Newport News for Designers and Engineers in many categories. Address inquiries to Employment Manager.

Newport News Shipbuilding and Dry Dock Company
Newport News, Virginia

Drill Rig Sets Up Quick Channel Blasts



TWENTY ROTARY DRILLS mounted on barge prepare charge holes to blast out 6 ft of rock from bottom of 6 mi stretch of Amherstburg Channel, near Detroit.

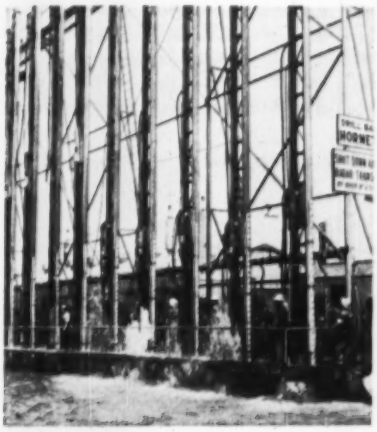
Twenty barge-mounted drills are setting up blasts to clear 6 ft of rock for six miles of channel-bottom at the rate of one blast of 500 lb of dynamite every hour and forty-five minutes. And deepening Amherstburg Channel of the Detroit River from 21 ft to 27 ft—part of the St. Lawrence Seaway's Great Lakes connecting links—is proceeding without disrupting normal water traffic.

The big drilling and blasting operation is being carried out by Marine Operators (ENR June 6, p. 31) from a specially built portable drill barge called the Hornet IV. Measuring 160 x 30 ft, the barge is fitted with twenty 40 ft rotary drills with 4¼ in. bits. The drills are installed on 50 ft masts permanently stationed 8 ft apart across the front of the barge. The masts have vertical tracks on which air motors and drills ride. Air for the drilling is supplied by the barge's seven 900 cfm air compressors, powered by 300 hp diesel engines.

Crews of 18 men per shift, three shifts a day, man the operation. The job begins by first lowering a hollow steel from each drill station to rock. The drill shaft is then lowered and drilling begins as air is concentrated at the drill point to force water and particles up out of the sleeve. Up to five drills are in operation at one time and the 20 hole sequence takes about an hour. Blasting crews work close behind, packing 20 to 30 lb of dynamite to a hole.

Winches on the barge work on cables connected to pilings on shore to move the barge from the blast area, and also off right-of-way of lake carriers. To secure barge while drilling, studs are lowered into the river bottom.

Deepening Amherstburg Channel is set at $23 million and involves removing 2 million cu yd of rock.



FIVE DRILLS AT A TIME work into the rock; 20 hole operation takes one hour.

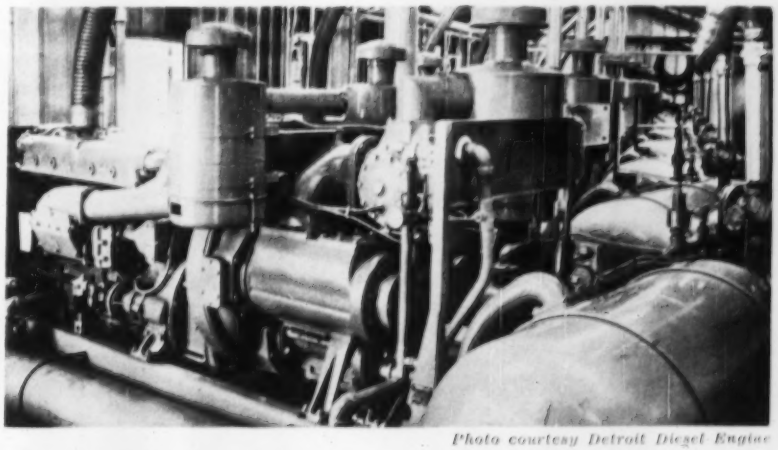


Photo courtesy Detroit Diesel Engine

SEVEN AIR COMPRESSORS of 900 cfm each are powered by 300 hp diesel engines.

27 cu. yds.

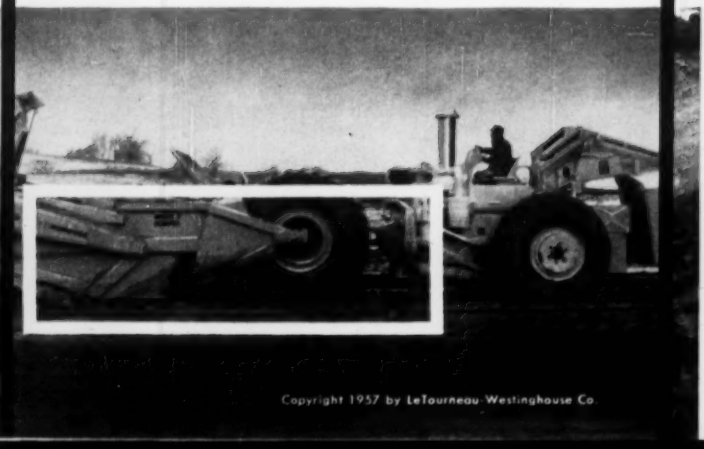
MORE FOR YOUR MONEY

Low-and-wide Fullpak Scraper produces more at lowest-net-cost-per-yard

This easy-loading LeTourneau-Westinghouse 27-yard Fullpak Scraper is the result of building more than 13,000 self-propelled scraper units over a period of more than 19 years. Its basic low-and-wide design has been thoroughly field-tested on hundreds of 18-yd. Model C Tournapulls on jobs all over the world. Using the same pusher in the same materials, the new 27-yd. B Fullpak gets heaped loads in approximately same time as most medium-size scrapers.

Direct-line thrust from pusher to cutting edge . . . cuts loading time

Large-size push-plate is positioned low, with angle of thrust in direct line with cutting edge of scraper bowl. There is no "humping action" of pusher or scraper. Direct-line thrust steadies scraper, keeps pusher on the ground, makes use of all push-power available. Scraper floor has a rise of only 1° when blade is on ground. Materials move in easily, with smallest possible resistance. This all adds up to easy loading . . . *faster loading* . . . bigger production.



Copyright 1957 by LeTourneau-Westinghouse Co.

advertisement

heaped

19.1 cu. yds., struck; choice of 300 hp GM or 293 hp Cummins engine; 10 forward speeds to 28.4 mph; 27 x 33 — 30-ply rating tires; 180° turns in 39'10"; positive fingertip electric controls

27-yard "B" gets capacity load of red clay in less than a minute, pushed by 420 hp LeTourneau-Westinghouse Twin-C* push-tractor.

with new easy-loading Fullpak* Scraper and new Big B Tournapull®

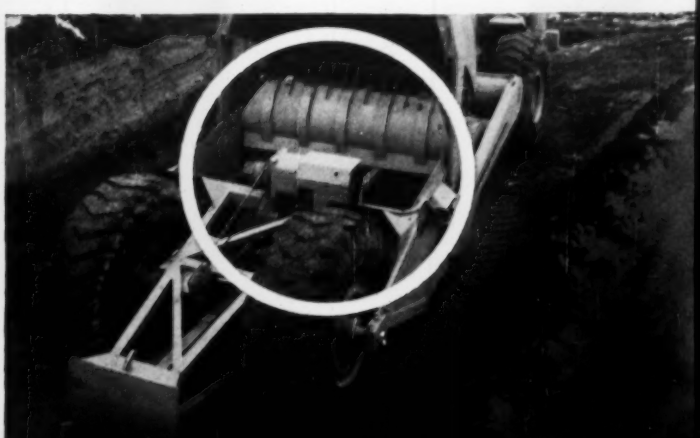
Positive power ejection . . . faster spreading

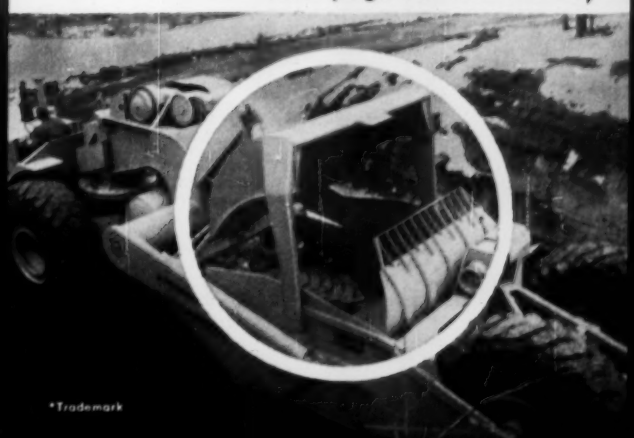
At the touch of an electric switch, operator moves vertical tailgate forward to eject load. Tailgate wipes bowl clean of mud, marl, or sticky clay in a single pass. Inside of bowl is cleanly designed, no angular obstructions to block material flow. With fingertip electric control, tailgate may be moved to any position in the bowl to create lively boil of material while loading. Curved top of tailgate rolls material into corners for fast fill and rounded heap.

High-lift apron makes sure anything that goes in comes out — fast

Apron lifts quickly to make an opening 10' wide x 7'1" high. Plenty of clearance to handle hunks of sod or gumbo, rocks, and other chunky materials. Deflectors on yoke arms prevent trapping of stones and sticky clay that might require manual cleaning. Large-diameter cable-drum on apron-hoist permits fast spooling without kinking, increases rope life. In closed position, apron carries big part of load for better distribution of weight, greater stability.

Turn page for more ⟶





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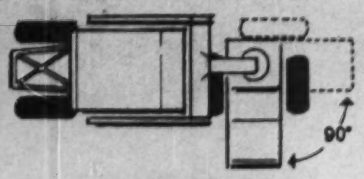
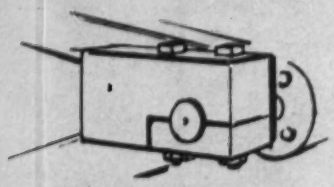


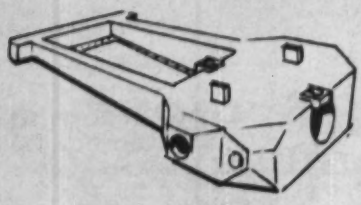
SHARP TURNS

...90° turning ability permits the "B" to turn in a space 4'2" less than its own length.



HIGH-STRENGTH

...high-grade metals, heat-treated and stress relieved, keep maintenance costs low, increase service life.



RIGID MAIN CASE

...of 1" and 1½" steel plate, maintains perfect alignment, absorbs stress and strain.

LOAD-RATED TIRES

...plenty of load-carrying capacity in big 27 x 33, 30-ply rating tires which are interchangeable all around.

Additional B Tournapull® advantages that give you MORE FOR YOUR MONEY

It takes more than a bat and a ball to make a home run hitter. The player with a high batting average must have strength, keen eyesight, and a sense of coordination that inspires split-second timing. He must be fast on the swing, fast on his feet, and in sound physical condition to last through extra innings of play.

The same is true of your self-propelled earthmover. Prime-mover, scraper, tires, power, and controls all must be in perfect balance and coordination to get maximum production with greatest efficiency. That is what LeTourneau-Westinghouse engineering and long experience give you in the new B Tournapull. In addition to its low-and-wide, easy-loading Fullpak* bowl, the new B Tournapull includes many features that add up to "more for your money". For example, the "B" gives you:

Exclusive LeTourneau-Westinghouse power-transfer differential . . . automatically diverts power to wheel on firmest footing when opposite wheel begins to slip. The "B" keeps on working in soft footing when other rigs bog down.

90° turn-ability, enables the "B" to make complete turn in 39'10"... a space 4'2" less than its own length. Works in restricted areas. Power-steer, through geared kingpin, swings prime-mover side-to-side in soft going, "walks" machine out of slippery mud and loose sand.

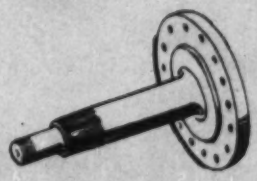
Big multiple-disc air brakes on all 4 wheels, with a total of 6552 sq. in. of braking surface assure quick, safe stops. For additional braking power on steep grades an electrotarder is available (as extra equipment).

Choice of 300 hp GM or 293 hp Cummins engine is offered for the Big "B". Choice of engine helps to minimize your parts requirements, hold maintenance costs to minimum.

These exclusive features, in addition to the other advantages described in this 6-page advertisement, show why B Tournapull with Fullpak Scraper can give you *more for your money*... earn bigger dividends on your equipment investment.

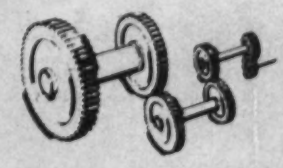
ANTI-FRICTION BEARINGS

...are used throughout to prolong life and increase the efficiency of entire drive train.



STRONGER AXLE

...massive heat-treated component that takes a severe beating. Brake elements are built to give long, trouble-free service.

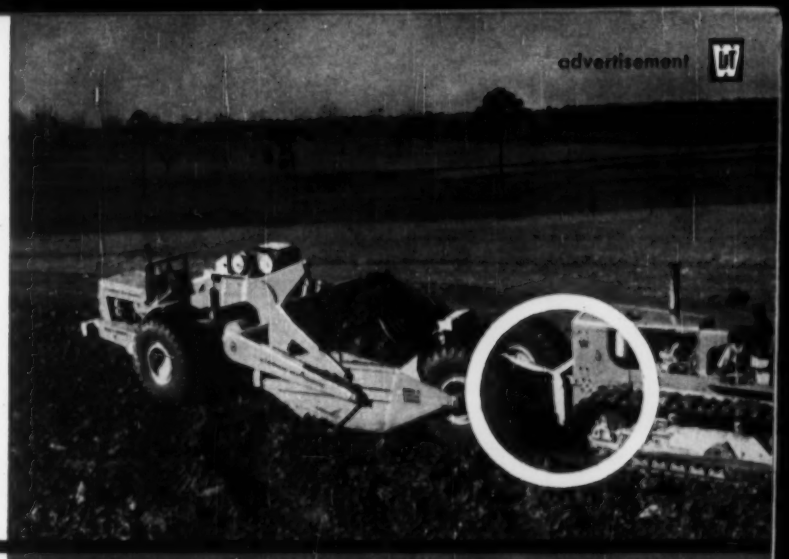


PRECISION GEARS

...accurately cut and hardened, to resist shock and assure smooth operation.

More pay-yards with same pusher-power

B Tournapull, with 27-yard Fullpak Scraper, gives you more pay-yards with the same pusher used to load 18 to 25-yd. scrapers. Because of its easy-loading advantages, the Big "B" heaps in record time, without need for tandem pushers. This saves man-hours and pusher costs . . . gives another "plus" advantage to owners of new B Tournapull.



More visibility . . . assures faster loading and spreading

Operator seat on new "B" is high and left-of-center. Operator can see blade, load, and pusher merely by turning his head. This makes it easy to position machine for better coordination with push-tractor and see signal for quick break-away the moment load is heaped. He can guide the big machine easily along narrow haul-roads, in the pit, on fill, and over rough terrain.

More speed . . . with instant, positive electric controls

An exclusive advantage on all LeTourneau-Westinghouse earthmovers. With fingertip electric controls, operator handles all movements of bowl, apron, and tailgate. He has power-steering, too, as on a modern automobile. He sits in a comfortable foam-rubber seat . . . with hands resting comfortably on wheel and control panel. No twisting of body or stretching of arms to reach awkward levers . . . your Tournapull operator works relaxed . . . he concentrates on getting bigger loads in less time . . . to give you "more for your money"

Turn page for more ⟶

*Trademark

To get more for your money . . .

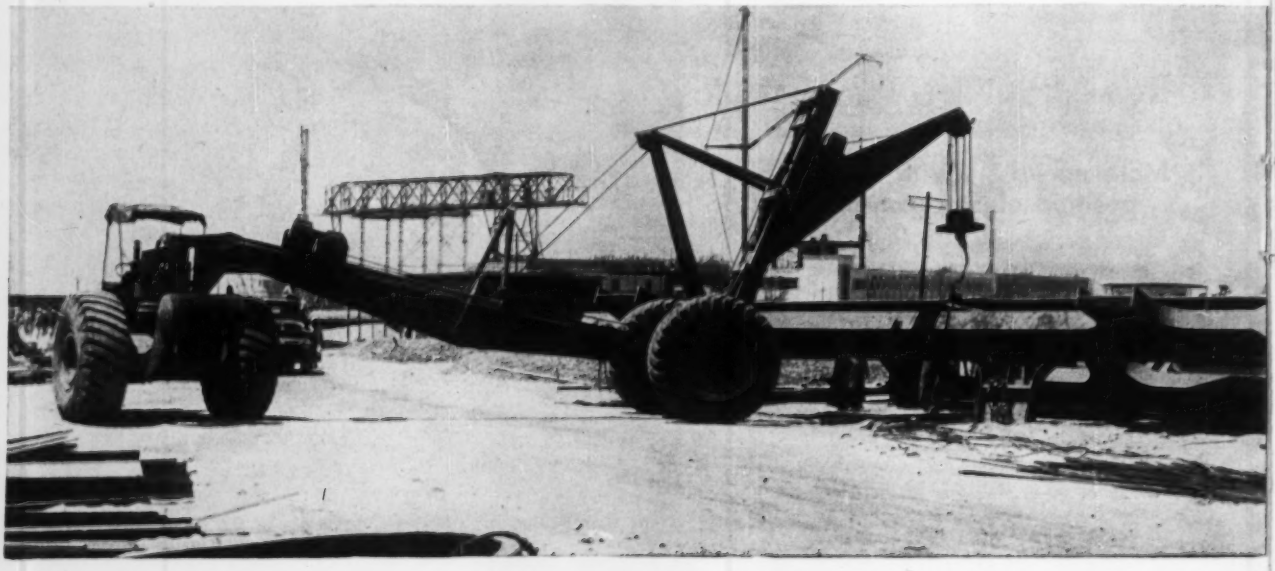
interchange 27-yd. Fullpak® Scraper with other haul units behind Big B Tournapull® prime-mover

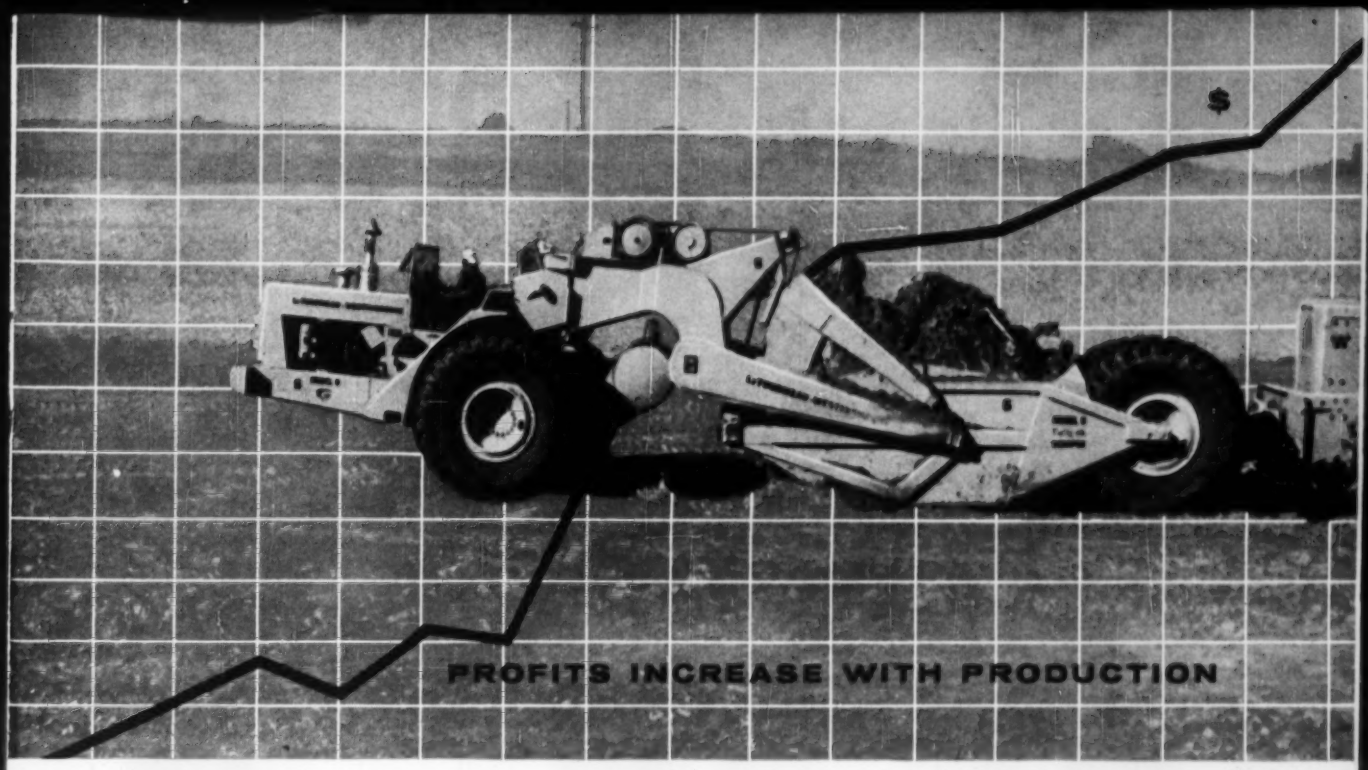
35-ton Rear-Dump

There are times when you need an off-road hauler to handle shovel-loaded materials. To meet these requirements you can interchange your Fullpak Scraper with a 35-ton B Rear-Dump . . . keep your Tournapull prime-mover working . . . avoid the need for standby trucks and operators. You'll find the B Rear-Dump a handy tool in tight places. It makes 180° turns in 35' . . . less than its overall length . . . travels in rough going where trucks cannot go. In dump position it makes a complete turn in 27'. Its bowl measures 15'6" x 10'2", offering a big target for dragline or shovel. It dumps over-the-edge clean and safe, because its streamlined body swings behind and below rear wheels to discharge load, and front-wheel drive keeps power and traction on solid footing. The B Tournapull Rear-Dump helps you cut costs, make quick profits.

30-ton Lift-and-Carry Crane

For stacking bridge steel, handling pipe, culverts, and precast concrete sections, unloading trucks and railway cars, lifting heavy machines and parts . . . you'll find the B Lift-and-Carry Crane a profitable tool for both yard and on-site service. It may be interchanged easily with Rear-Dump or Fullpak Scraper units. This 30-ton mobile crane goes anywhere, maneuvers easily in tight places. It has a maximum lift to 24'9" and a reach of 25'. It is especially useful on occasional jobs where heavy materials must be lifted and carried over distances that would otherwise require flat-bed haulers . . . often eliminates need for building access roads. It is another application of the B Tournapull prime-mover and a specially designed trailing unit which can help materially to increase the money-making possibilities of the heavy haulers in your equipment spread.





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Then let us show you a new B Tournapull in action. When you see for yourself how easily the low-and-wide Fullpak Scraper scoops its load... packs material quickly in all corners of the bowl... and pulls out of the pit while dirt still settles on its capacity heap... you'll know why the Big "B" has a place in your future equipment spread.

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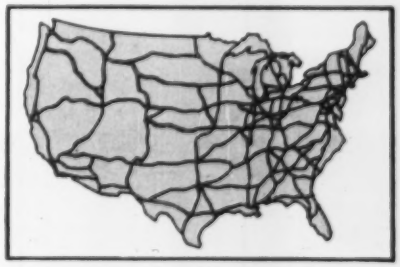

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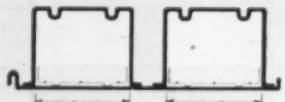

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SECTION M2 (Acoustical)

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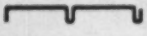
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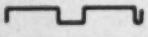
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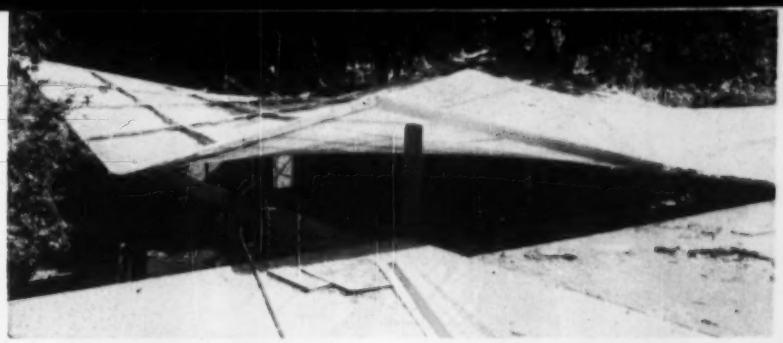
DESIGNER-BUILDER of the plastic roof pictured at right, William Orr displays partly completed prestressed plastic box beam used over door openings.



HYPERBOLIC PARABOLOIDS, site-cast with cold-setting resin and reinforced with glass fiber, roof a 31 x 31 ft building. Edge beams are prestressed with glass-fiber rope.

CENTER POST (arrow), used during erection to shore up corners of four sections meeting at center of building, was not needed after panels were bolted together.

Reinforced Plastic Roof Is Cast at Site

Hyperbolic paraboloids molded of plastic and glass fiber now roof a building in Fort Worth, Tex. The cost of the novel roof was only $1.25 per sq ft, according to William Orr, civil and chemical engineer who designed and built the structure as an extension to his workshop.

In plan, the building is a 31 ft square. The roof comprises four 17 x 17 ft hyperbolic-paraboloidal sections, their edge beams bolted together to form a single unit.

The four sections, each with two diagonally opposite upswept corners and another pair of downcurving corners, are oriented so that high points occur at the center and four corners of the roof, and low points at the midlength of each side.

With the help of an unskilled four-man crew, Orr constructed the sections on the site and lifted the 400 lb units by hand to the supporting columns. During erection, the roof was supported by five posts, located at the corners and center of the building. The center post was removed, however, after the sections were bolted together.

The roof sections are sandwich panels, molded on wood frames. Made of 1 x 2 in. wood strips, the frames were covered on one side with canvas and glass-fiber mat. Then Orr poured over the surface a cold-setting liquid resin. It permeated both the glass fiber and the canvas before hardening.

He varied the thickness of the plastic according to calculated stress variations over the panel, making the thinnest layers ⅛ in., the thickest ¼ in.

The assembly was then turned over and the process repeated, thus trapping the wood frame and a 2 in. air space between plastic shells. In casting the first quarter of the roof, however, he left the wood members exposed, as shown in the top photo.

The edge beams of each section, hollow box-section members, were formed and prestressed by allowing the plastic to flow completely around the 1 x 2 in. perimeter members of the wood frame and embed pretensioned glass-fiber strands, which had been stretched along the top and bottom of the 1 x 2's. The sides, or webs, of the box beams were made ⅛ in. thick, the top and bottom, containing the pretensioned strands, ¼ in. thick.

Walls of the building are 3¼ in. concrete. They were cast on the ground and erected by the tilt-up method. Plastic panels fill the triangular openings between the top of the walls and the bottom of the roof. Lintels over door openings are reinforced, prestressed plastic box beams, similar to the panel edge beams but approximately 4x6 in. in cross section.

For this roof, Orr used clear resin. But it admits too much light, he has discovered. He plans to darken it later and to add color to the plastic for future roof jobs.

And there will be future jobs, he figures. Such advantages as low cost, easy handling, translucence and fire resistance will take care of that, he believes.

At present, he is building a plastic carport at his home. It will cost about $250, he estimates. Other projects in the offing include a roof over a used-car lot and a prestressed plastic footbridge across a highway between a motel and a beach.

Pittsburgh's

As a part of a long-continuing struggle to break out of the confinement of rugged hills that are a part of their everyday transportation problems, Pittsburgh's residents are today watching construction men change their city's face even more.

Right now, for instance, there are these major traffic projects going on:

- The complex, 2½-mile-long downtown interchange, on the Monongahela side of the city's business triangle;
- An equally complex high-speed interchange at Etna, on the north bank of the Allegheny River somes miles north of the city center;
- A $17 million tunnel under 400 ft high Mt. Washington, opposite the famed "Golden Triangle", which will connect directly with a new bridge across the Monongahela and with the already-operating Penn-Lincoln Parkway West, access to the city's airport and surburban areas.

This maze of structure bridging a stream, a railroad yard and local streets at Etna interchange is not even the most complex of three major interchanges now under construction. Allegheny River borders model at lower side of photo. Steep hills (upper right) must be benched out to make room for the road.

New bridge a spectacular double-decked tied arch structure—will bridge the Monongahela River to connect a new tunnel with city's famed "Golden Triangle" in background. Bridge piers await steel erection, due to start in late August.

Portal for 3,600 ft twin Mt. Washington Tunnel will be at base of clearing scooped out of 175 ft high hill. More than 300,000 cu yd of material will come out of clearing work alone. Houses (upper right) will be razed.

Traffic Bottlenecks Begin to Break

And, by the end of the summer, these other projects will be under way:

• Fort Pitt Bridge, a new $16 million (with approaches) double-decked tied-arch bridge across the Monongahela will replace the existing and badly outmoded Point Bridge and connect to the new Mt. Washington Tunnel.

• The Crosstown Boulevard, cutting across the broad base of the Triangle, through a newly-cleared slum area to connect the two rivers;

• Another vastly complex traffic interchange across and over the tip of the Triangle to carry traffic to and from the new Fort Pitt Bridge, major highways on both sides of the Triangle and to yet another proposed new bridge across the Allegheny.

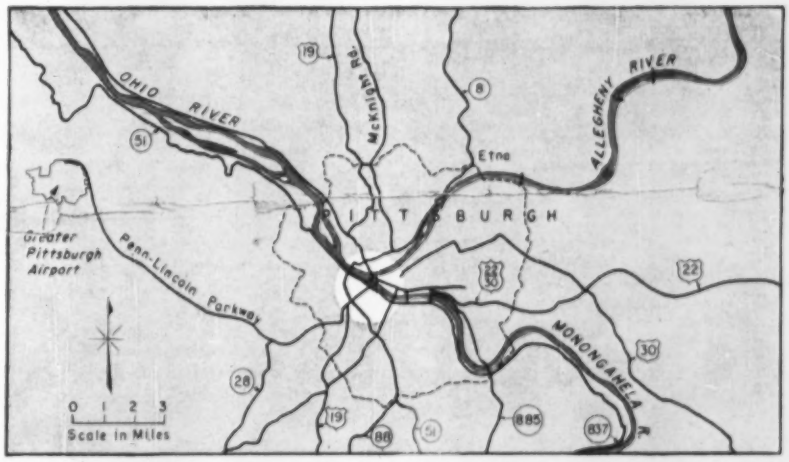
All this work—and more—is part of a long-planned $150 million program to ease traffic flow for this city of nearly 700,000 people and its tributary area which has an estimated population of more than 5 million. And that program itself is only a small part of a still larger plan—now well under way—to rebuild the city and its business area literally from the ground up into the most modern and efficient of U.S. municipalities. (ENR Jan. 27,1955, p.47)

• **Geography a must**—Pittsburgh's rather spectacular geographical setting has to be viewed, birds-eye fashion, before anyone not intimately familiar with the region can get a clear picture of the difficulties confronting highway engineers.

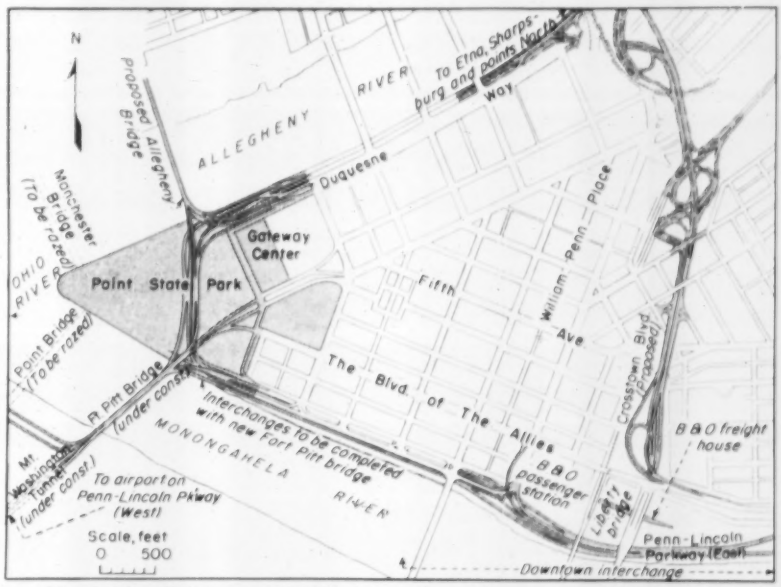
The Allegheny River (flowing generally from the northeast) and the Monongahela (coming from the southeast) meet at Pittsburgh to form the Ohio River. The two rivers thus form two sides of a triangular piece of rocky land that points like a sharp arrowhead almost due west. Both rivers have been great commercial arteries throughout the city's history—and remain today as major carriers of coal, ore and other heavy commodities. And of course, the presence of these natural waterways was the root of the city's original growth as a defense point in early colonial days and as a commercial center and steel manufacturing capital ever since.

Both of the rivers wind through deep, narrow valleys. And the point on which the city stands—except for the relatively small (330 acres) flat piece on which the city's business community stands—is itself a series of steep rocky hills cut by old ravines and small streams.

The city has grown right up the sides of all its hills, on all sides of the rivers; and the resulting crazy-quilt of narrow streets, running in many directions—



Problem at a glance. Dozens of major highways converge on city's congested area, winding through narrow valleys and through sizeable hills, confined by river crossings . . .



. . . New work will open up city's heart, provide quicker access to financial hub, easier travel for through traffic.

choked with trolley cars, buses, cable-operated "incline" cars—has been a continuing plague to traffic engineers and businessmen alike.

So when the Allegheny Conference—backed by the municipality and by civic and business interests—was formed in 1943 to plan the rehabilitation of the city, traffic facilities were a major part of the program, along with such matters as smoke control, slum clearance and rehabilitation of the city's business heart.

• **Start from ends**—First steps in the highway program were taken on the eastern and western ends.

The Penn-Lincoln Parkway East was planned to run from the junction of heavily travelled U. S. route 22 (near the suburb of Churchill), through the city along the Monongahela shore. This road would then join the Penn-Lincoln Parkway West, running for 17 miles west from the Ohio River and slightly north to a terminus at the Greater Pittsburgh Airport, near Coraopolis.

The first two pieces built (opened in 1953) were a 7 mile section of Parkway East from Churchill to Bates Street, in Pittsburgh proper—but several miles short of the Point; and the Parkway West from the airport to the foot of Mt. Washington,—from where the state built a by-pass route around the "mountain" to reach the existing Point Bridge to the city. The local press hailed these

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. . . Bottlenecks are breaking

two roads as "glory roads to nowhere", since they terminated far short of their objective—a through route within the city.

• **Missing links**—The missing sections, which are now under construction, were the Downtown Interchange and the section taking the road along the Monongahela bank to the Point, the new Fort Pitt Bridge and the Mt. Washington tunnels.

From an engineering standpoint, the interchange is probably the most complex road job, and certainly it is one of the most difficult from a construction viewpoint.

It is in fact several interchanges with roads and ramps that must cross over or pass under the numerous bridges (both railroad and vehicular) that cross the river along this stretch. In addition, it required moving the entire passenger and freight yards of the Baltimore & Ohio railroad 300 ft to the side, the construction of a new railroad station for suburban trains and the demolition of the old station.

Add to these problems the more usual ones of construction in any major urban area—utilities to be moved, traffic to be maintained, and the somewhat unusual one of cramped space between the river and steep slopes—and you have a very tough construction job.

Some measure of the complexity of the interchange design can be gained from the fact that it involves—in an actual lineal length of 2½ miles—nearly 18 miles of roads on structures.

As of June, the Grant Street section of the interchange was nearly completed and in partial service; the new B & O station and yards built and ready for use, and demolition of the old station was under way. Meanwhile, contractors were bridging or tunelling under local streets, casting retaining walls, driving piles to support structures, and getting ready for pavement on other sections.

• **New bridge**—Foundations for the new Fort Pitt Bridge, located about 600 ft to the east of the existing Point Bridge, are already in place. They have been for more than a year. Superstructure work is expected to start as soon as steel for the structure is delivered, late in September.

The 2,600 ft long structure will be double-decked to carry one-way traffic on each deck. A feature will be the 750 ft long tied arch that will form the center span, with a bottom clearance of 47 ft over mean water in the river. The tied arch was dictated by the geographical conditions. The steep side of Mt. Washington rising almost straight up from the water on one bank

Big city construction work is tough anywhere. Old railstation must move over here.

and the city itself (and the need for connecting roads) on the other left no room for abutments for a suspension or other type of more conventional structure.

The reason for the new bridge and the proposed structure directly north of it across the Allegheny is obvious from a glance at a map or at the actual situation.

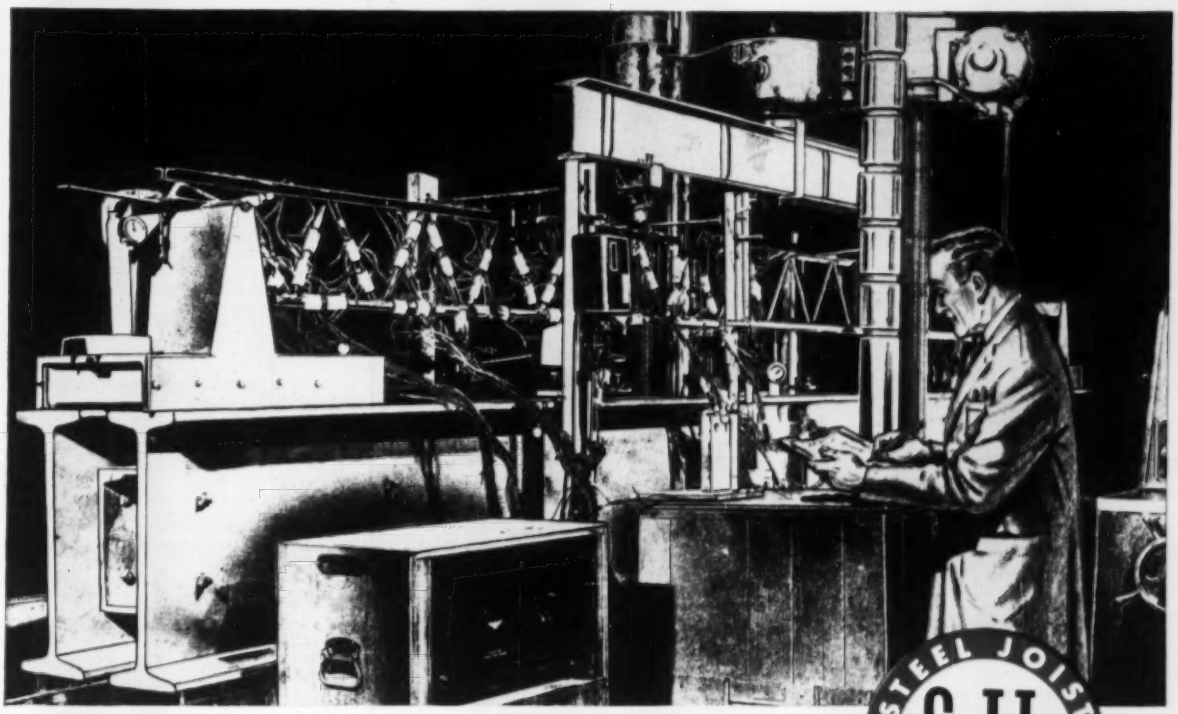
The two existing bridges—the Point Bridge, angling southwest, and the Manchester Bridge, angling northwest —have their Pittsburgh terminals within less than 300 ft of each other. Both carry trolley car and bus lines, and the jam of traffic in that narrow space with both structures pouring traffic into it, can reach monumental proportions at peak hours.

The two new structures (the old ones will be razed) would terminate at a wider section of the Point, where space can be provided for proper interchanges.

• **Tunnel**—Just getting under way in early June was the Mt. Washington tunnel that will cut under the big hill to connect the new Fort Pitt Bridge and the Parkway West. A $11 million contract awarded to Merritt-Chapman & Scott of New York covers the initial part of work. Total cost will be about $17 million.

The twin tubes will be somewhat peculiar in construction, in that at the bridge (north) end they will be built on two levels to meet the double deck of the bridge structure but will be on the same level at the south end where they will join Parkway West at Saw Mill Run.

Cut through the reddish shale that characterizes the area, the tubes will be



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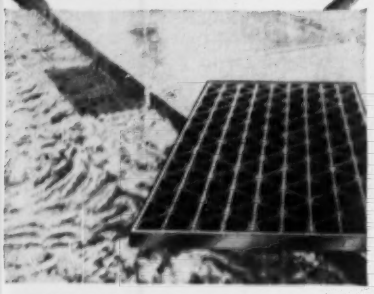

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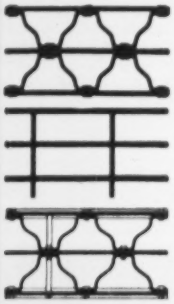

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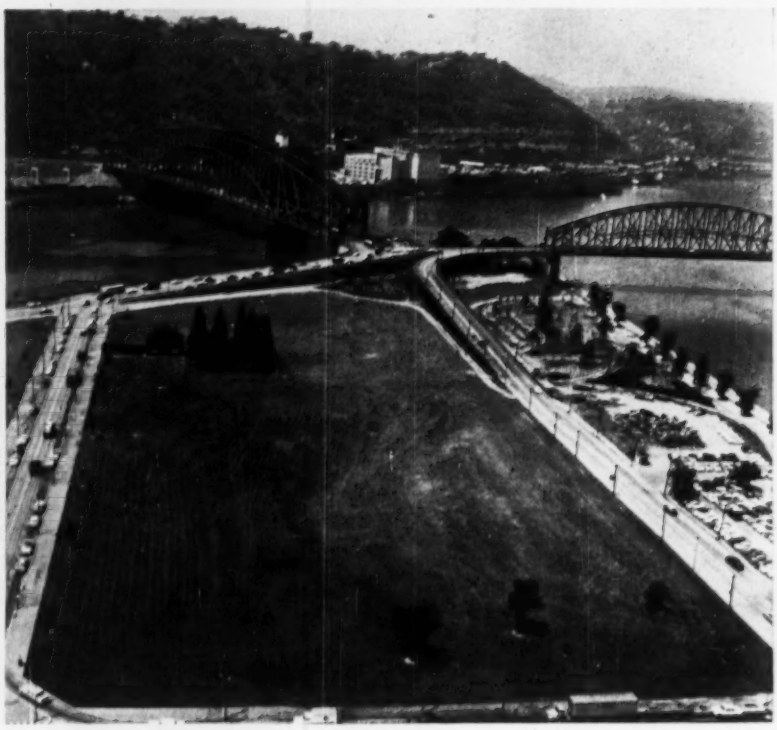


Problem and partial solution are visible in this scene. Park area in foreground was once commercial slum, cleared in city's redevelopment program. Two bridges, coming together within 300 ft of each other, will be replaced, with interchange over park.

U-shaped, 25½ ft high, 24 ft 10 in. wide at base. Each will carry two lanes of traffic.

The tunnels will be built entirely from one end—the south end. The steep cliff on the river end and a shelf occupied by a 4 track line of the Pennsylvania Railroad precludes work on that end, so all drilling and haulage of muck must be handled one way.

On the south side, a subcontractor, Latrobe Const. Co., is now at work scooping out the tunnel portal in a sheer hillside more than 175 ft high—an area from which he will move, by shovel and truck, more than 300,000 cu yd of spoil for disposal about two miles away. The existing Parkway West serves as a haul road. MC&S plans to use only one jumbo in drilling the two tunnels, moving the jumbo from one to the other to drill while the holes are shot and mucked out.

• **Etna interchange**—North of the city, on the far bank of the Allegheny, is the town of Etna, the Borough of Sharpsburg and a complex of smaller communities all cling to the sides of steep hills. An obsolete and completely inadequate wood-floored bridge now connects Pittsburgh proper with this area, and to Routes 8 and 28 to the north and northwest.

The interchange now under construction at Etna will pick up traffic from the city (it is planned to replace the old bridge); from East Ohio Street—a main artery now being reconstructed that parallels the north bank of the river, and from the two main highway routes.

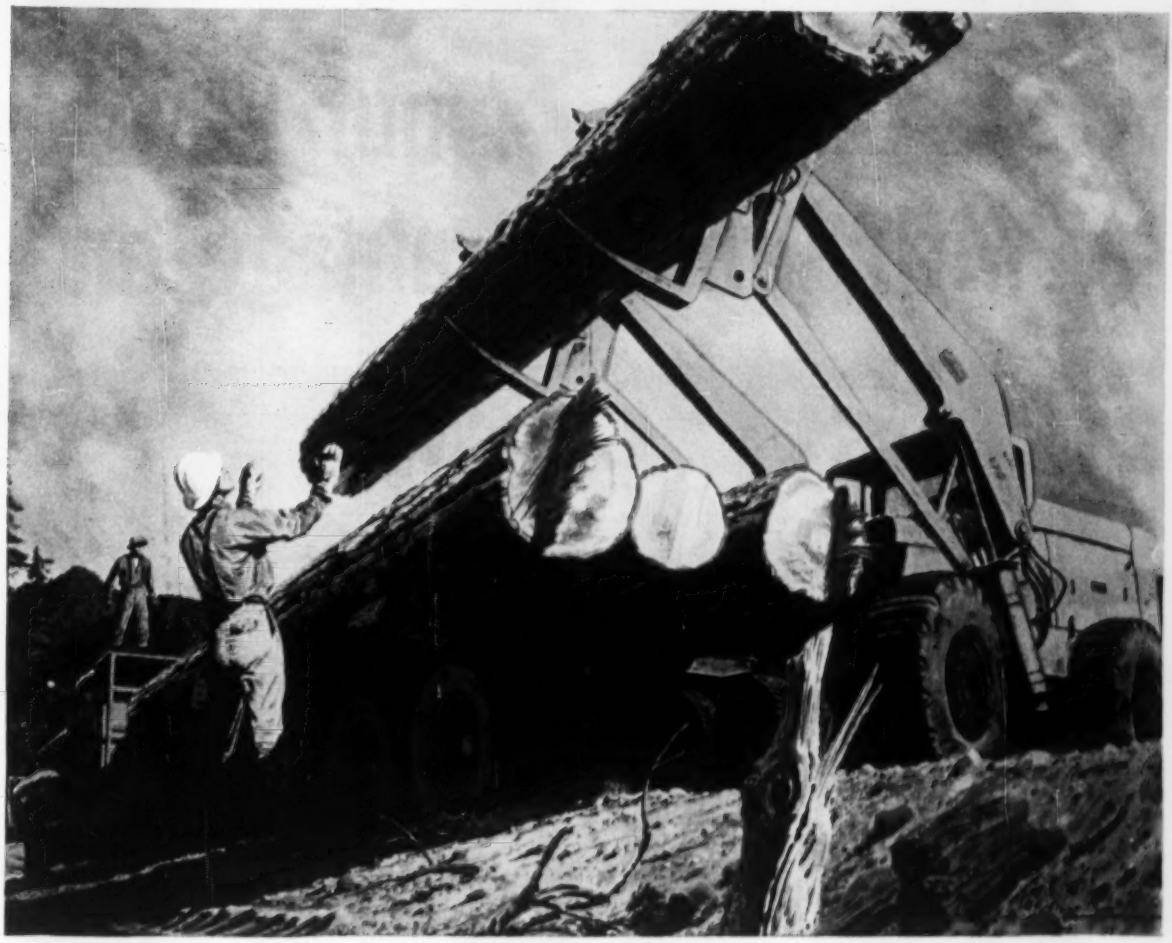
Involved in the construction—along with several miles of structure—is the realignment of Pine Creek for a distance of about a mile and relocation of railroad tracks.

Work on the Crosstown Boulevard is not yet under way, pending clearance of the substandard slum area known as "The Lower Hill" through which it will pass. A new civic center, housing projects, park areas and office structures are planned for the 85 acre area now being cleared.

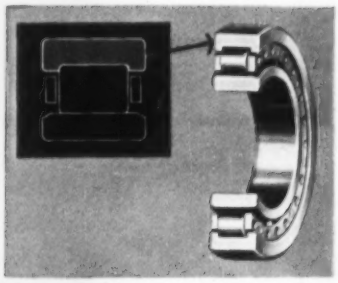
Three consulting engineers are aiding the Pennsylvania Department of Highways on the work around Pittsburgh:

Richardson, Gordon & Assoc. of Pittsburgh, on the Downtown Interchange from Brady St. to Stanwix St., the Point Interchange, which includes the two bridges and the grade separation at the point, and the Etna Interchange; Michael Baker Jr., of Rochester, Pa., on the Mt. Washington tunnels; and Gannett, Fleming, Corddry & Carpenter on the parkway west of the tunnels.

Leonard J. Curran is engineer in charge for the Department of Highways.



Loggers' "weight-lifter" tests bearing staminal



TWO-LIP RACE INCREASES RIGIDITY

Two parallel shoulders made integral with the outer race, as shown in gray above, increase rigidity and durability—keep rollers in proper alignment. Precision-ground rollers and races give quieter, smoother operation.

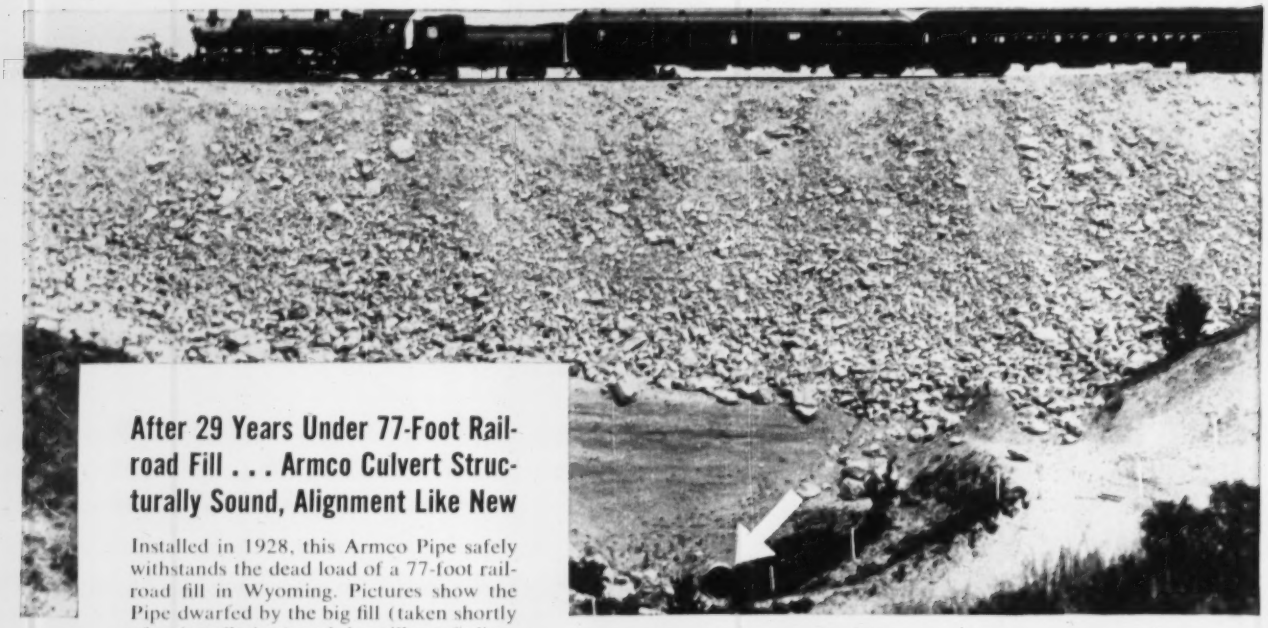
Tossing around logs 6 feet in diameter like toothpicks is no job for a softie! This machine has to be *built* for it right from the start—*right down to the bearings.* And that goes, too, for the trucks which haul these back-breaking giants over the most rugged terrain. Bower tapered and straight roller bearings have been *engineered* for just such work as this—to last longer, perform better under any road or load condition. Painstaking quality control plus basic bearing design refinements—like those shown at left—have reduced Bower Bearing failure to a practical minimum. *Whatever* your product, if it uses bearings, specify Bower! There's a complete line of tapered, straight and journal roller bearings for every field of transportation and industry.

BOWER ROLLER BEARING DIVISION
FEDERAL-MOGUL-BOWER BEARINGS, INC. • DETROIT 14, MICHIGAN

BOWER ROLLER BEARINGS

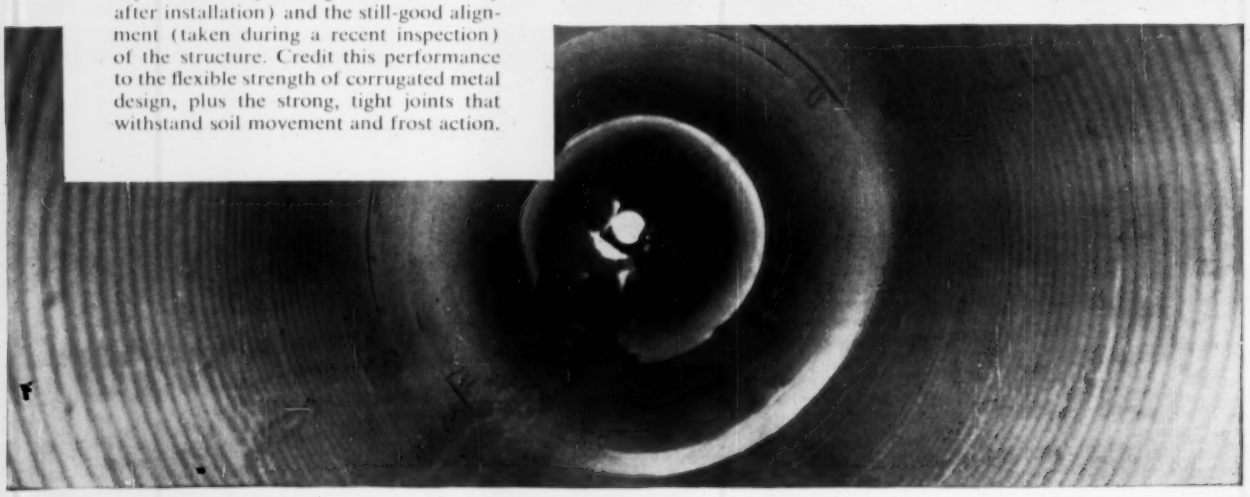
DURABILITY–your key to with Armco Drainage and

Proved durability is the surest kind of economy. Your initial cost is spread over many years. Thus, long service life of Armco Drainage & Construction Products on highway, municipal and private projects means low cost per year. Look how these Armco Product histories prove their long-range economy.



After 29 Years Under 77-Foot Railroad Fill . . . Armco Culvert Structurally Sound, Alignment Like New

Installed in 1928, this Armco Pipe safely withstands the dead load of a 77-foot railroad fill in Wyoming. Pictures show the Pipe dwarfed by the big fill (taken shortly after installation) and the still-good alignment (taken during a recent inspection) of the structure. Credit this performance to the flexible strength of corrugated metal design, plus the strong, tight joints that withstand soil movement and frost action.



low cost per year of service Construction Products

Storm Sewer in Service Since 1914

For more than 42 years, this 36-inch Armco Pipe has been providing storm sewer service for an Idaho city. Present condition is rated good, with the likelihood of many more years of service. This is real economy through durability.

Early Armco Steel Building Demonstrates Long Service, Low Upkeep

Erected in 1939, this 40- x 60-foot Armco Steel Building serves the Bishop Stansell Company, West Carrollton, Ohio, Development Engineers for the printing industry. One reason for the present excellent condition of this plant is the extra metal thickness of the STEELOX® Panel Wall and roof covering. Extra thickness means more durability—and in Armco Steel Buildings the covering material is up to 66 per cent thicker than that on ordinary metal buildings.

County Proves Armco Walls in Slope Control Application

One of the first installations of Armco Bin-Type Retaining Walls was made in 1938 to control the slope above this county road in Ohio. Other types of slope control had been tried here, but were unsuccessful. Then, in 1954, after the durability and stability of the Armco Wall had been proved in service, the county solved a similar problem on a slope below the road. Picture shows the new wall under construction (foreground) and the first wall still on the job (left background).

Write for More Information

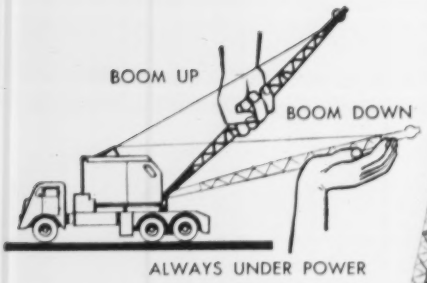
Get helpful, free data on service-proved Armco Drainage and Construction Products—including Armco SMOOTH-FLO® Sewer Pipe, FLEX-BEAM® Guardrail, Bin-Type Retaining Walls, Steel Buildings, Water Control and Sewage Gates, Steel Sheeting and a wide range of Corrugated Metal Drainage Structures. Write us, or call our nearest sales office. Armco Drainage & Metal Products, Inc., 5317 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

Armco Construction Products

ARMCO®

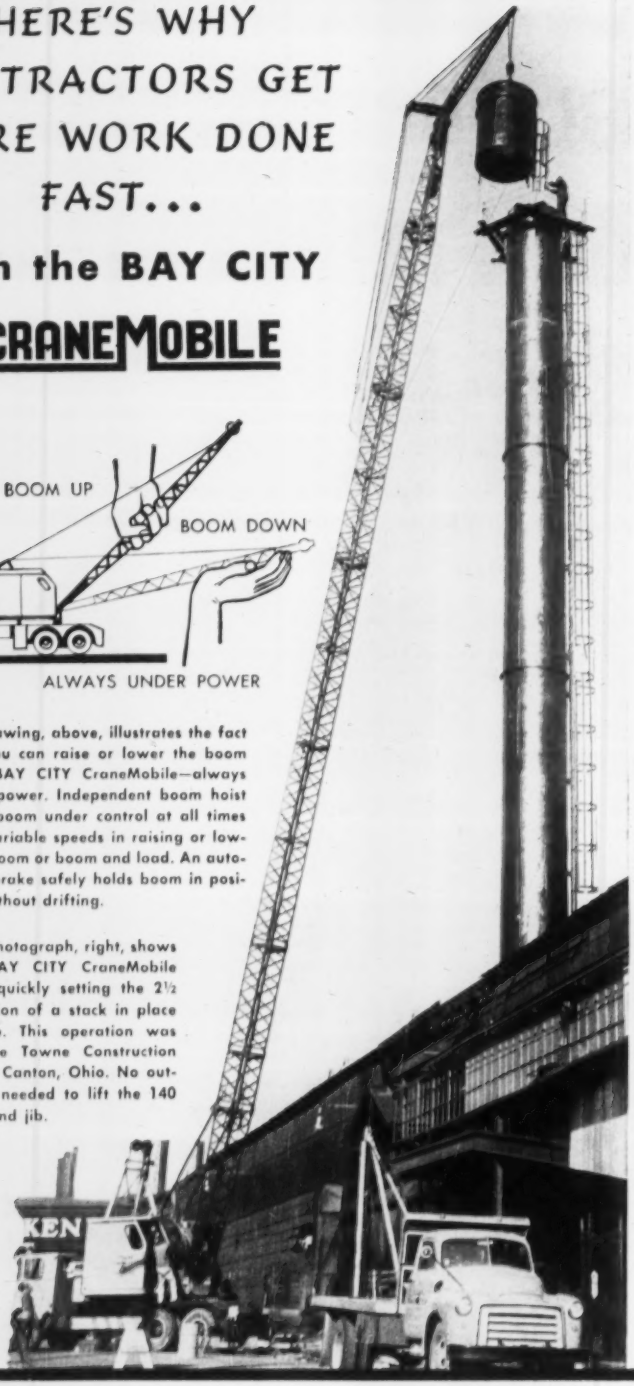
HERE'S WHY CONTRACTORS GET MORE WORK DONE FAST...

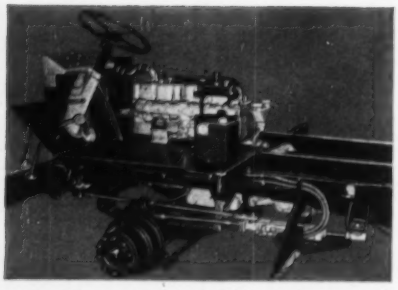
with the BAY CITY CRANEMOBILE



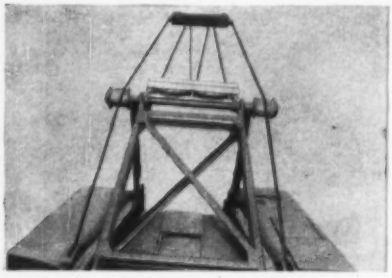
The drawing, above, illustrates the fact that you can raise or lower the boom on a BAY CITY CraneMobile—always under power. Independent boom hoist keeps boom under control at all times with variable speeds in raising or lowering boom or boom and load. An automatic brake safely holds boom in position without drifting.

Operating photograph, right, shows a 25-ton BAY CITY CraneMobile safely and quickly setting the 2½ ton top section of a stack in place 130 feet up. This operation was done by the Towne Construction Company in Canton, Ohio. No outside help is needed to lift the 140 foot boom and jib.

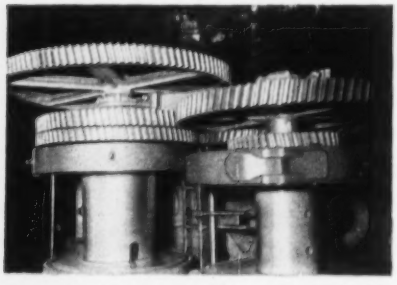




Modern Power Steering for safe, sure control of CraneMobile on the road and quicker maneuvering into position on the job. Also standard are the six-wheel air-brakes.



Hi-gantry, floating bridle and boom back-stops give positive control of long or short booms in every operating position. Gantry collapses within recessed cab-roof to reduce overall clearance when traveling.



Power load-lowering device, consisting of idler gearing between drums, permits controlled lowering of loads against engine compression without braking. Adequate power at all times is assured by high-torque, high compression, high H.P., low R.P.M. power plant.

BAY CITY SHOVELS, INC. • BAY CITY, MICHIGAN

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SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

266

New-Auto Headache

New automobiles make road marking difficult

The insistence of automobile manufacturers on building longer and ever-lower automobiles is posing a new problem for highway designers, it became apparent this week.

The Wyoming Highway Department said it has been forced to lengthen all "no passing" zones in the state as a result of the lower auto silhouette, and would ask the American Association of State Highway Officials to recommend nationwide adoption of such longer zones.

Robert O. Connell, Wyoming state traffic engineer, explains the trouble:

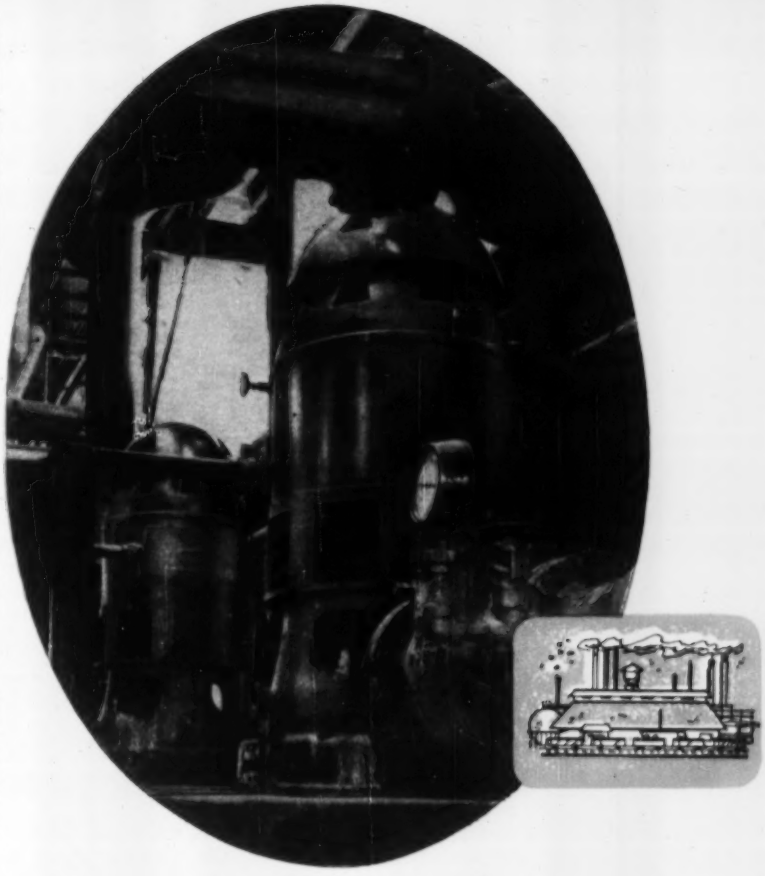
Until recently, two vehicles travelling 1,000 ft apart were used in determining the length of "no passing" zones near the crest of hills. When a point 4½ ft high on the leading vehicle dipped out of sight as the machine dropped over the hill, the point at which that happened was marked as the beginning of the double-line marking the "no passing" area. The double line would be continued until the lead car was again visible.

But with the newer cars, said Mr. Connell, drivers are closer to the ground, and thus can't see over the crest of hills as soon as they could in older models.

Threaded Nails and Spikes Show Strength in Lab Tests

Threaded nails and spikes made a good showing in recent tests conducted at Virginia Polytechnic Institute. These are among the findings detailed in three reports by E. George Stern, research professor of wood construction at the school's Wood Research Laboratory, Blacksburg, Va.:

- Threaded nails and spikes have about 2½ times the initial holding power of their plain-shank counterparts.
- Predrilling increases the holding power of both threaded-shank and plain-shank nails; the best hole size is two thirds the diameter of the nail shank.
- In three-member joints, threaded nails in double shear equal twice their number in single shear.
- Heat-hardened nails and spikes are more resistant to buckling and can, therefore, be driven more rapidly than those made of bright, low-carbon steel. Furthermore, being relatively slender, they can be spaced more closely with



Verti-Line®

PROCESS PUMPS

in

COOLING SYSTEM

At the Brea Chemical Company in Southern California two 50 HP Verti-Line process pumps are handling 1800 GPM at 105°F, returning water from the ammonia synthesis area to cooling towers. *These units have been operating 24 hours a day since May, 1954 – without maintenance expense other than normal service.*

Over 100,000 satisfied vertical pump users agree there's no pump like Verti-Line for low first cost, economical operation, and negligible maintenance.

Send for new brochure, "PUMPS FOR SALE" Ask for Bulletin E-77

IF YOUR NEEDS INCLUDE PROCESS PUMPS, IT WILL PAY YOU TO INVESTIGATE VERTI-LINE BEFORE YOU BUY

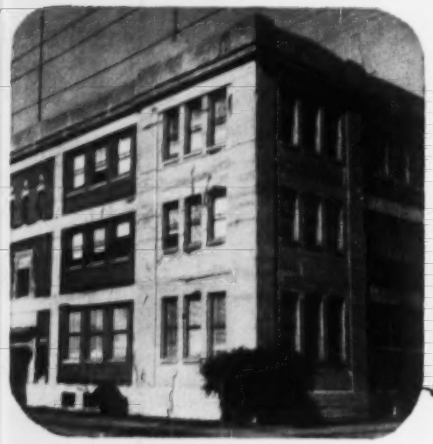
Verti-Line Pumps are exclusive products of

LAYNE & BOWLER PUMP COMPANY

general offices & main plant

2943 VAIL AVENUE • LOS ANGELES 22, CALIFORNIA

THORITE and THOROSEAL furnish office building with *That New Look* plus all-weather protection.

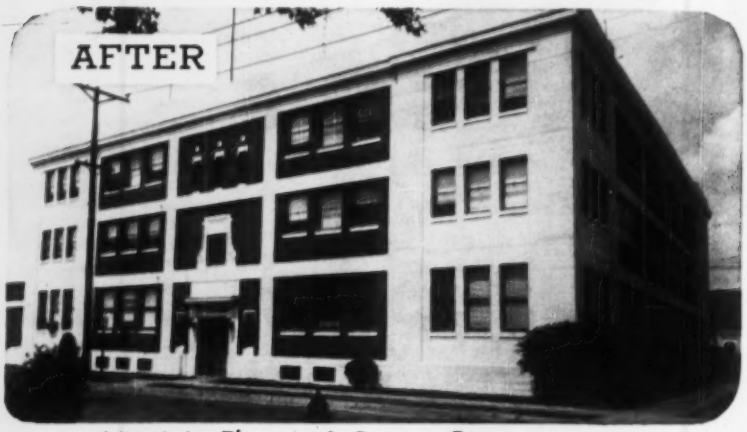


BEFORE

Severe weathering had deteriorated sections of cornices, sills, lintels and ledges. Cracks permitted water penetration, causing damage to interior of building.

All cracks were opened with hammer and chisel, spalled areas cut and cleaned, then patched with THORITE, followed by two brush coat applications of Pearl Gray THOROSEAL.

Brick was left uncoated to develop pleasing contrast. See Circulars No. 16 and 20.



Virginia Electric & Power Company
Richmond, Virginia

THORITE ***NONSHRINK PATCH*** 20 minute set patching mortar

THOROSEAL ***MASONRY SEALER*** seals masonry walls against water and beautifies surface

How to do it" GET OUR 16 PAGE BROCHURE

STANDARD DRY WALL PRODUCTS, INC.
NEW EAGLE, PENNA. CENTERVILLE, IND.

less danger of splitting the wood.

• When nails and spikes longer than 4 in. are needed, the heat-hardened varieties are cheaper to use than the heavier bright kind, despite the cost of heat-treating.

Certain of the tests extended earlier investigations by Professor Stern. For example, threaded-shank and plain-shank nails and spikes from 4½ in. to 11 in. long are compared with respect to withdrawal resistance; similar comparisons of 3 in. and 3½ in. nails were made several years ago (ENR April 6, 1950, p. 32).

Professor Stern noted that the initial advantage of threaded-shank over plain-shank nails becomes even more pronounced with seasoning if the wood at the time of driving is green or only partly seasoned. This is important since most permanent timber and pole structures are built with lumber that will season in place.

The experimental work is reported in three pamphlets published by VPI: No. 26—Nails and Spikes in Creosote-Pressure-Treated Southern Pine Poles and Timbers; No. 29—Wood, Plywood or Steel Gusset Plates for Nailed Trussed Rafters; and No. 30—Holding Power of Large Nails and Spikes in Dry Southern Pine.

Column Research Council Receives Special Grant

The Engineering Foundation, a department of United Engineering Trustees, Inc., has given a special grant of $3,500 to a new project of the Column Research Council. The project promises ultimately to yield safer, cheaper structures. It is aimed at making use of new data relating to the strength of compression members.

The grant will be used in preparing a guide for preparation of specifications for metal compression members.

At the annual conference of the Column Research Council, held May 16 at Lehigh University, Paul P. Bijlaard, professor of structural engineering at Cornell University, spoke on results obtained in a Cornell research project on methods for calculating the critical load of a truss and eccentric buckling of elastically restricted columns.

Thomas C. Kavanagh of Praeger & Kavanagh, New York City consulting engineers, summarized the results of research conducted over the last 30 years on effective length of columns.

Robert L. Ketter, assistant professor of civil engineering at Lehigh University, presented a method for determining the strength of structural members containing residual stresses.

"Union's industrial lubricants... afford maximum protection"

Franklin Ahn, project superintendent, Honolulu Builders, T.H.

"Our experience with Union Oil's industrial lubricants dates back to 1952, and it has all been good.

"Union lubricants have kept our equipment rolling smoothly on the beach and sea wall job at Kona, just as they do on our various other construction projects around the islands.

"A good example of the protection you get with Union lubricants is shown by the type of work being done by this 78 Northwest shovel. T5X Motor Oil and Unoba Grease afford maximum protection, even when equipment must operate continuously in several inches of sea water."

Mr. Ahn is right about the protection you get with Union Oil Company's industrial lubricants. No others can compare with *the finest*. Let a Union Oil lubrication engineer give you his recommendation for your equipment and try them on your next job.

UNION OIL COMPANY 76
OF CALIFORNIA

Los Angeles: Union Oil Bldg. • **New York:** 45 Rockefeller Plaza • **Chicago:** 1605 Bankers Bldg. • **Boston:** 214 Harvard Ave. **Philadelphia:** No. One Wynnewood Rd., Wynnewood, Pa. • **Kansas City:** 612 W. 47th St. • **Dallas:** Fidelity Union Life Bldg. **New Orleans:** 644 Nat'l Bank of Commerce Bldg. • **Atlanta:** 1401 Peachtree St.

DOES THE KING OF THE CRAWLERS PAY ITS WAY?

Let's talk push-loading. We'll use some figures—that's the only way to tell a dollars-and-cents story.

On a job in Munsing, Michigan, not long ago, a Caterpillar D9 Tractor and a competitive machine were both push-loading in moist sand with some gravel in it. The other machine loaded 18.3 cu. yd. in .91 min. That's 20.1 cu. yd. a minute. The D9 pushed 18.5 cu. yd. into the scraper in only .58 min. That's 31.9 cu. yd. a minute. In other words, the D9 loaded over 50% faster than the other machine, and developed a larger load while doing it.

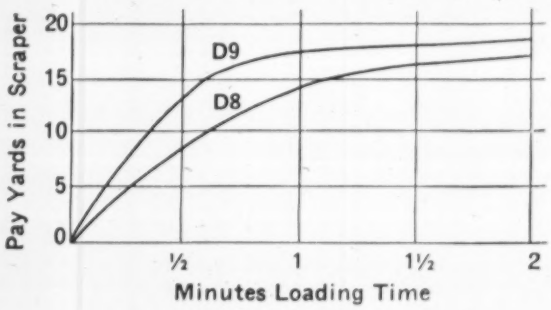
In Belmont, N. C., a D9 and a different competitor were push-loading in sandy clay. The other machine handled 15.3 cu. yd. in .67 min. Or 652 cu. yd. an hour. The D9 handled 17.2 cu. yd. in .42 min. Or 860 cu. yd. an hour. This was a half million cubic yard job; the D9 could have completed it in 3½ weeks less time than the other machine.

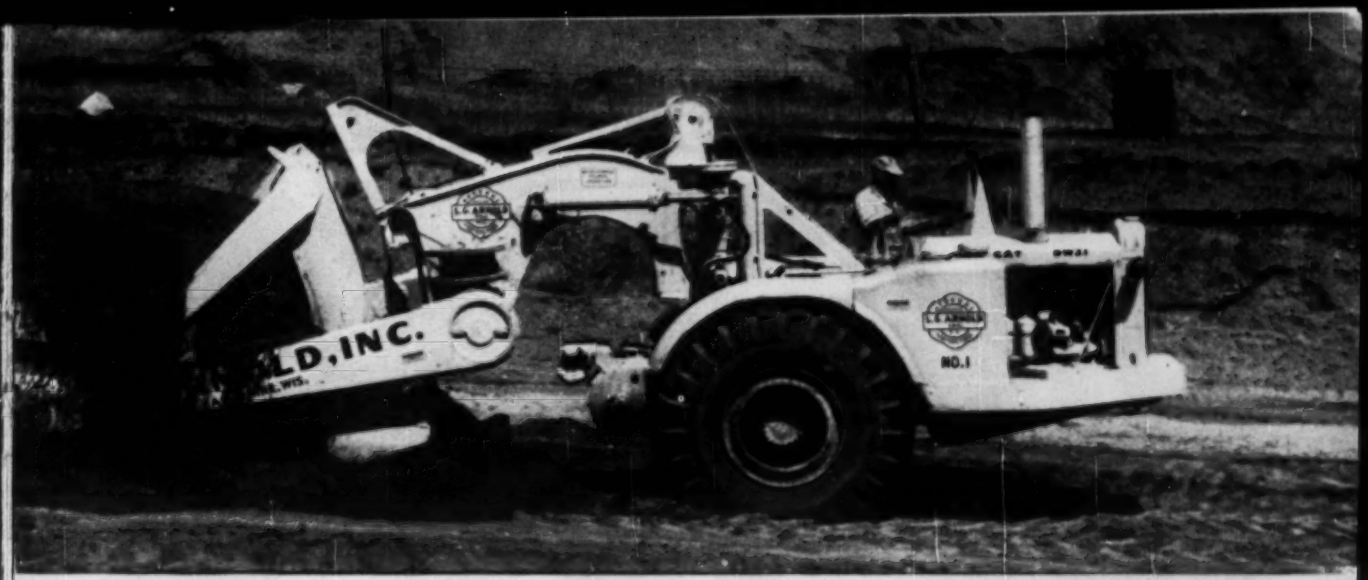
On a job in Minot, N. D., on another in Atlanta, Ga., the story was much the same.

Compare a big yellow machine with another big yellow machine

Maybe the best way to spell out how the D9 can boost profits is to compare its performance not with another make but with this famous CAT* D8 Tractor.

Owners and operators know what the D8 will do. Pound for pound, it's the best-producing crawler in its class today. The D9 is bigger, has more power. Does this added size and power really make a difference? Look what happens when you have a D8 and D9 both pushing DW21-No. 21 units on the same job:





D9 push-loads DW21 with No. 470 Scraper on highway job in Wisconsin. Ten-mile job calls for handling 120,960 yards, mostly sandy gravel. D9 loads DW21 in gravel in 70 seconds here, with heaping loads up to 25 yards. Vice President F. L. Carr of L. G. Arnold, Inc., says, "The D9 pusher has more than lived up to our expectations." Grade Superintendent Phil Dudenhoefer adds, "Outproduces by far any other machines on the job."

Forget size, weight, horsepower. Forget toughness and agility. These only point to what counts most: out on the job, how does the D9 really stack up against competition in cost-per-yard?

Or compare these two big yellow machines this way. Say on a job your haul distance averages 1,875 feet and you're using three DW21-No. 21s with one pusher. If that pusher is a D8, you stand to average 344 yards an hour. If it's a D9, you'll get 412.

Now, say your spread is made up of the pusher and the three wheel units, plus a No. 12 Motor Grader and another crawler with 'dozer and roller. Figure your hourly owning and operating cost. Count in the depreciation, taxes, gas and fuel, lube oil, grease, repairs and labor, and operators' wages. If your pusher is a D8, a reasonable figure for the spread would be $73.52 an hour. If it's a D9, your costs could come to $77.32. But remember, you're getting 344 yards with the D8, and that comes to 21.4¢ an hour per yard of dirt. With the D9, you're getting 412 yards at $77.32 an hour—which figures out at 18.7¢ per yard of dirt.

The D9 would save you 2.7¢ per yard, *and* give you 68 more yards, each and every hour.

Naturally, these figures might not exactly match your own. But they are figures based on actual performance records and they tell an honest story.

Would the D9 make more money for you?

There are jobs that would not warrant a D9. With the rugged D8 available, there may be no need to call in the 29-ton, 320-flywheel-HP D9. But the above figures certainly prove this much: on job after job, the D9 *is* paying its way, no matter how close the records are kept. One of these jobs could be yours.

But don't just take our figures for it. Call your Caterpillar Dealer. Have him demonstrate the D9 on your job. Check it with *your* watch, in *your* dirt, against *your* books. *That'll* tell the tale.

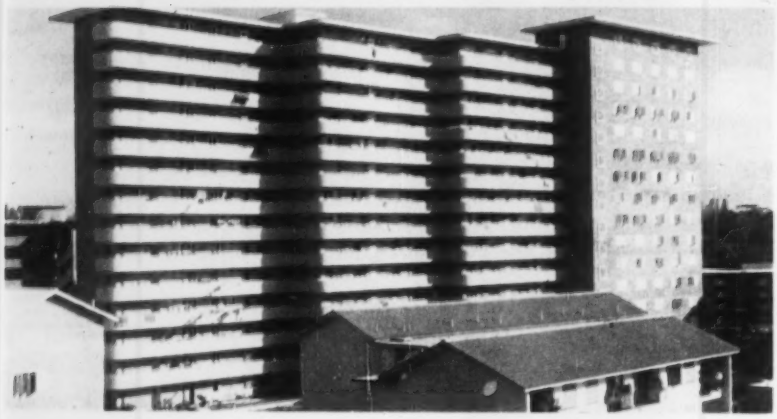
Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

THE D9— PROFIT BUILDER

Diesel Engines • Tractors • Motor Graders • Earthmoving Equipment

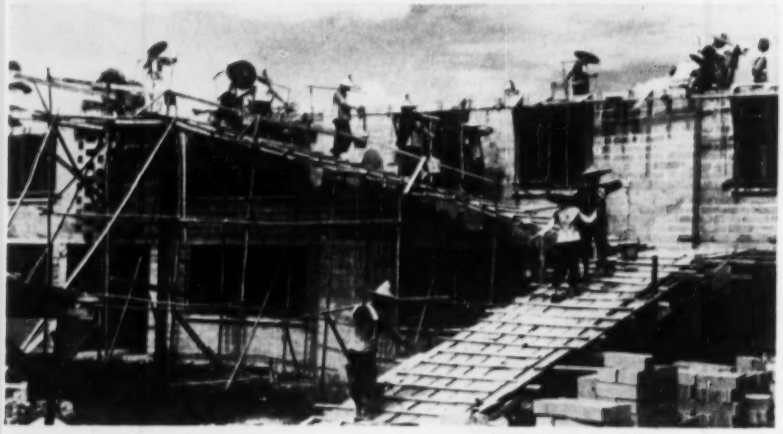


▲

1. ONE OF THE HOUSING ESTATES with which Singapore officials are attempting to meet a population increase of 45,000 persons per year.

◀

2. NEWEST PUBLIC HOUSING in Singapore includes some 14-story structures like this one. Smaller buildings frequently surround the larger ones. Each project benefits in design improvements as experience shows the way.



◀

3. HAND LABOR STILL PREVAILS in the construction procedures used for Singapore's modern housing.

▶

4. LASHED JUNGLE SCAFFOLDING is the rule on even the tallest buildings. A modern note on this apartment is the use of precast concrete units for the balconies and for the grills over some of the windows.

Singapore's Progressive Public Housing:

- **Aims at 6,000 units annually**
- **Includes row houses and 14-story buildings**
- **Benefits from site subsidy only**
- **Shows significant design advances**

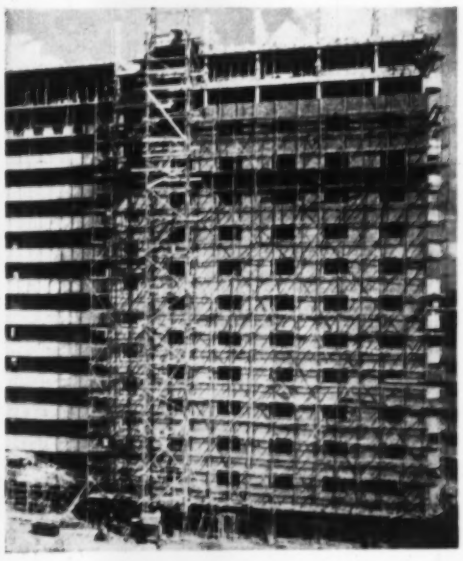
R. F. Legget

Director, Division of Building Research, National Research Council of Canada
Ottawa, Canada

Low-cost, low-rental housing of exceptional economy and outstanding design is to be found by the traveler in one of the most unexpected places in the world, Singapore. Dominant feature of a 224 square mile island is the city which has a present population of almost 1,300,000, increasing at the rate of 45,000 a year.

But instead of being engulfed by this mounting concentration of urban population officials have responded with a progressive development of public housing now culminating in multi-story reinforced concrete blocks of apartments—beautiful in appearance, clean-cut in design and economical in operation. All have been built without benefit of direct subsidy.

Residents of these notable housing projects are Chinese, Malays, Indians and many other races which make up the polyglot population of this equatorial city.



Within a radius of two miles, it is possible to see the various stages in the development of public housing in Singapore over the last ten years and to observe the way in which the designers have used every new project for further advance in their designs, based on experience with completed buildings. This is building research of significance, carried out by an integrated team of architects and engineers, with economics as a powerful determinant.

The climate assists. Mean night and day temperatures of the year are 77.4 and 84.3F respectively. Therefore, no domestic heating is required. Rainfall, although heavy (97 in. per year) is not torrential so that drainage arrangements, though ample, need not be unusual. The simple living habits of the occupants call for no elaborate interior finishes or equipment, but accompanying illustrations show that the results achieved in external design would be a credit to any city.

• **A special housing body**—Responsible for the housing is the Singapore Improvement Trust, a public body with six appointed and five official members, set up originally in 1927 essentially as a planning body. The trust has prepared a master plan for the development of Singapore, and this is of great importance locally. But its housing work is the activity which has attracted world-wide attention.

This started in 1936. The authority was taken from Section 44 of the Trust's Act which states that "the Board may, with the approval of the Governor in Council, erect such buildings as the Board may think fit." A small block of flats was first erected for sale, but the experience was not satisfactory and so a new start was made at building housing for rent.

Population densities in the central part of the city of more than 1,600 people per acre—and 300,000 people living in one 100 acre area—were revealed by a special committee reporting in 1947. Housing communities away from the centre of the city were, therefore, the first development of the trust. Today, however, work is proceeding also on slum clearance projects within the central city area.

• **Types of structures**—After the Japanese occupation during the war, single-story, row housing units were built with precast concrete post and panel walls and asbestos-on-timber roofs. From the outset, close attention was given to the appearance of even such simple units, colour being used in exterior finish with brilliant effect. Simple shops and open-air market places were built integrally with each block of housing units.

Later, 2 story units with concrete block walls and tile roofs were built, with every detail of design refined to the last degree on the basis of experience gained. These are regarded, however, as only "semi-permanent" housing, rents being based on an anticipated life of 40 years. They do not make the best use of land, even though they do give the lowest rentals possible.

Blocks of 3- and 4-story apartments, also of load-bearing block wall construction, formed the next stage in the development of economical housing designs. The final stage was the jump to reinforced concrete frame construction, with brick wall fillings, permitting the design, first, of 7 story structures, now increased to 14 storys. Inevitably this meant the use of passenger elevators.

When the writer heard, some three years ago, of an order for a dozen passenger elevators for a Singapore housing scheme, he almost wrote off the report as a joke. Now that he has ridden in one of them, with some of the Malay and Chinese residents, he realizes that they have provided the key to an otherwise insoluble housing problem, daring as their adoption must have seemed in the first instance. Automatic in operation, with cars as simple in design as possible, the elevators have proved to be very satisfactory; no unforeseen maintenance problems have arisen.

• **Full utilities are provided**—Gas and electricity are supplied for cooking. All kitchens are equipped with sinks and built-in drainage boards. Built-in cupboards are another standard feature that has been carefully correlated with the detailed planning of the individual family living units. Chutes are used for centralized refuse disposal in all the larger blocks of flats. Modern sanitary fittings feature the simple toilets which are part of even the smallest flats.

(International continued on page 82)

78 cents per million gallons... pumped by Westinghouse

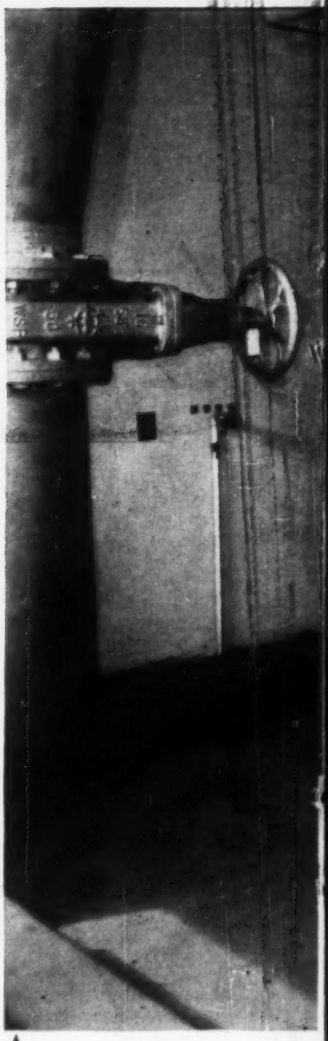
Basic operating cost of pumping stations in the Tacoma, Washington, sewage plant is of more than usual importance in the over-all plant cost because of an unusually high gallons-per-capita-day flow through the system. Engineers found it necessary to plan for nearly three times normal.

In the main pumping plant at Tacoma, four Westinghouse vertical pump motors handle the load. They are cut in and out as required and the sequence of rotation changed automatically. The station is unmanned except for periodic checks and maintenance by operators from the treatment plant.

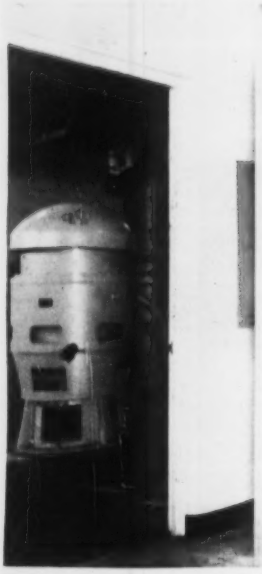
Although the pumping requirement is high in proportion to the population served (about 67,000) the actual pumping cost is not. Yearly costs in the Tacoma plant average about 78 cents per million gallons of sewage pumped. Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa. J-94075

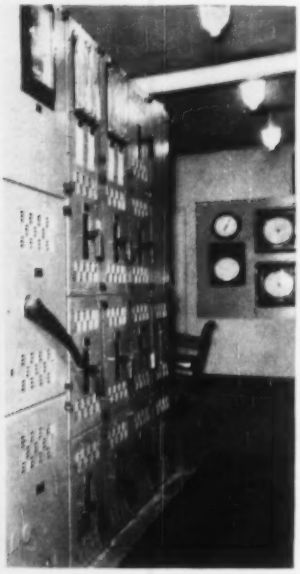
YOU CAN BE **SURE**...IF IT'S

Westinghouse

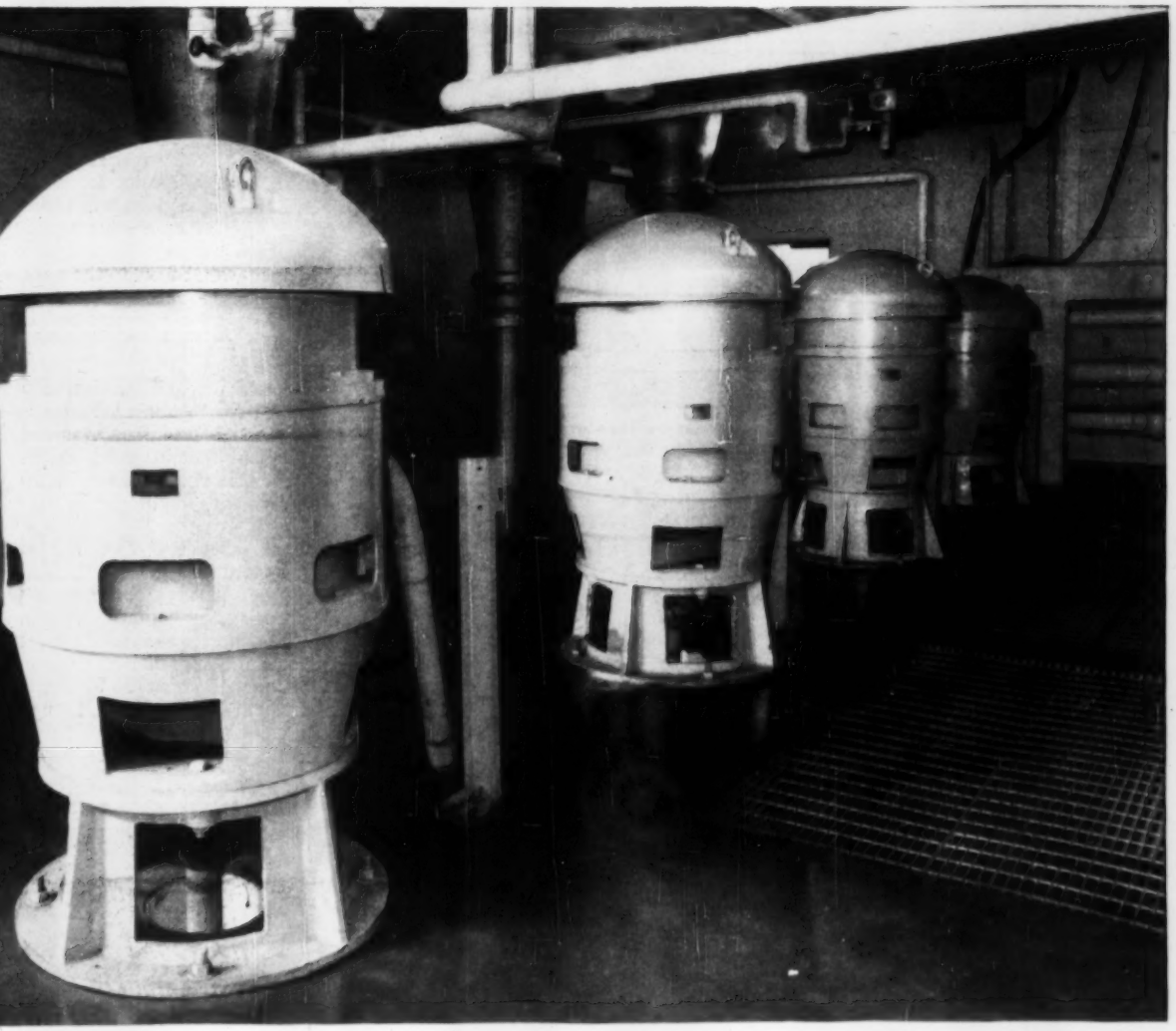


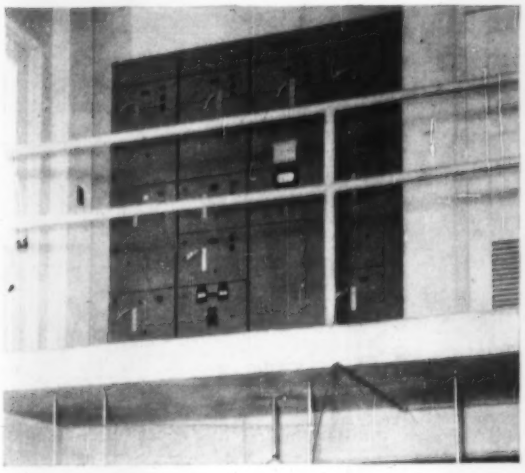
The four Westinghouse vertical pump motors in the Tacoma plant—4000 gpm, 50 hp; 8000 gpm, 100 hp; 10,000 gpm, 100 hp; 12,000 gpm, 125 hp.



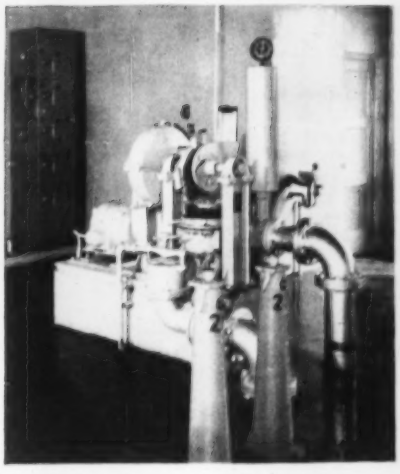


Distribution of power to motor and lighting circuits for the entire plant is through this Westinghouse switchgear, located in the main pump building.



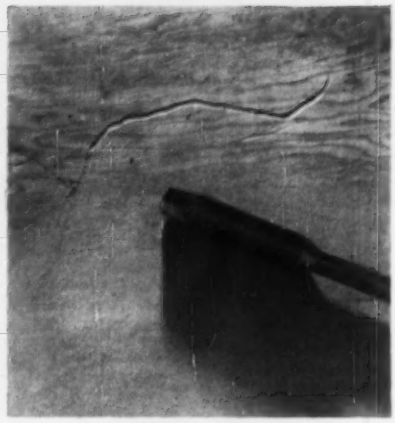


Control center for many of the sewage plant motors, located on a balcony to conserve space, is typical of the Westinghouse unitized equipment which simplifies sewage plant electrical construction.



This Westinghouse motor drives one of the many pumps in the treatment plant. Note convenient location of control unit for this and other adjacent motors.

Rubber Tips Prevent Scars on Finished Concrete



Deep gouges and scars from steel vibrator tip on form face results in additional expense of clean up work.

Smooth finish concrete is produced by use of rubber tipped vibrators because they do not damage form face any more than ordinary pencil eraser. Extends the life of reusable forms.

More and more contractors rely on Viber Rubber Tipped Vibrators to end form face damage to concrete forms. Replaceable rubber tips, a Viber exclusive feature, eliminates possibility of accidental gouging or scarring of form faces, and expensive grinding or hand finishing of blemishes caused by gouged forms.

Where exposed concrete surfaces are an important part of the job, Viber Rubber Tipped Vibrators assure a perfect finish. They extend the life of your costly forms and end patching and replacement expense.

Another advantage of the replaceable rubber tip (where most wear occurs) is that it results in longer vibrator housing life.

Machined steel base and super-tough molded rubber body are combined to provide positive mechanically interlocked metal-to-rubber anchorage. This prevents any possibility of rubber coming off until it is ready for replacement. Tip replacement requires only the time necessary to unscrew the old tip and replace with a new one.

Standardize now on Viber Rubber Tipped Vibrators as other leading contractors have done.

Write for illustrated literature and name of nearest authorized distributor. Viber Company, 726 South Flower St., Burbank 12, California.

Rubber tip is easily replaced by simply unscrewing worn part and replacing with new tip.

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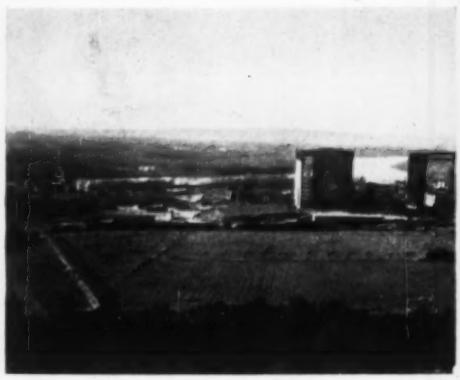
Construction methods present few unusual features to western eyes, apart from the extensive use of hand labor and such peculiar local practices as the use of lashed jungle timber for scaffolding (even for the highest reinforced concrete buildings). Some precast concrete units, such as balconies and the decorative open-work covers to the light courts, are mass produced in casting yards. All construction above ground is by open-tender contract, and bidding is always keen.

Only for site preparation does the Improvement Trust employ its own forces, through a recently organized mechanical plant section which maintains and operates the necessary earth-moving equipment.

• **Site cost is subsidized**—The cost of land in Singapore is high, and the displacement of "squatters" on building sites has been a very serious problem. In 1955, therefore, the government agreed to pay the cost of site development in excess of about $8,000, and this arrangement is still in force, though infrequently used.

This, so far, has been the only direct



France Adds Two

France's first nuclear energy plant is nearing completion at Marcoule, a town on the Rhone River about 400 miles southeast of Paris. By early 1958 this nuclear power plant will be producing about 350,000 thermal kilowatts as a by-product to 220 lb per year of pure plutonium. At full capacity, Marcoule will divert 85 megawatts into the French power network.

When completed, Marcoule will have reactors. The first reactor, G-1, as the three high-energy uranium graphite graphite-moderated reactor is called,

subsidy given to public housing in Singapore. All other costs are borne by capital from government loans and by rentals received from tenants. So-called permanent structures are financed by means of 4% 60 year loans; the so-called temporary housing is financed by 3% 40 year loans.

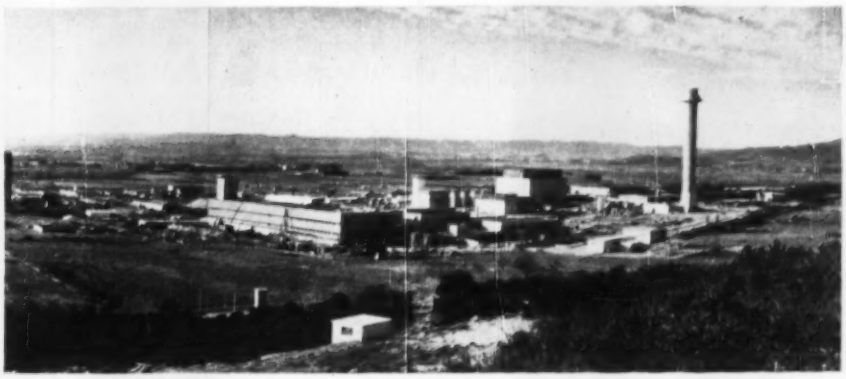
The capital cost of a 3 room apartment in a permanent building has been reduced to $1,700, mounting to a maximum of $2,160 for a 4 room apartment. These costs cover the entire structure and all services, including roads but not, as already noted, the cost of the site itself. With these basic costs, it has been possible to fix maximum monthly rents for 4 and 3 room apartments at $18 and $16 respectively, with $10 per month as the rental of one of the "temporary" housing units.

Family incomes for tenants are limited to figures which result in the above rental figures ranging from 13.75 to 15% of income. These percentages may be compared with the range of from 15 to 20% of family income suggested by the International Federation of Housing and Town Planning.

Equally significant is the overhead cost for the architect's department of the trust, responsible for designing and supervising the construction of the housing. Accurate cost accounting shows this to be no more than 2½% of the capital cost of construction.

• **Progress, but big job ahead**—By the end of 1956 the Improvement Trust had constructed 15,601 dwelling units and 622 shops, with a further 3,111 units still under construction. The trust is aiming at an annual target of 6,000 housing units per year which will accommodate about 40,000 people. That this figure would still only deal with the present annual increase in the population of Singapore, and do nothing to clear the slums, is a measure of the challenge faced by the trust as it is estimated that it would cost no less than $80,000,000 to rehouse the 250,000 residents of the city who at present reside under such conditions.

J. M. Fraser is chairman and general manager of the Singapore Improvement Trust. The writer is greatly indebted to this Scottish-trained architect and city planner for a personal introduction to this housing development.



Reactors to Nuclear Energy Center

was completed and its initial output of electrical power diverted into the national high tension grid in September, 1956. Reactors G-2 and G-3 were under construction when G-1 was completed.

G-2 and G-3 will be the principal energy and plutonium-producing reactors of the Marcoule center. They are cooled by CO_2 in a closed circuit under of massive armor plating, 4 to 8 in. in delivering four to five times as much heat energy as the air cooled G-1. Reactors G-2 and G-3 each will generate 150,000 thermal kilowatts, with 40 megawatts of surplus electrical energy per reactor available for delivery to the power grid.

Speed is the byword in building the nuclear power center. Constructing the twin pressure vessels for G-2 and G-3 of massive armor plating, 4 to 8 in. in thickness, within a reinforced concrete shell many feet thick would have been much too slow. Since concrete thickness would be needed in any case for biological protection, it was decided to combine the radiation shield and structural strength in a single enclosure of prestressed concrete 9 ft 10 in. thick, 46 ft long and 46 ft in external diameter. Instead of the bulky armor plating, the concrete pressure vessel was lined with steel plate having a thickness of 1.2 in.

The cylindrical pressure vessel is prestressed by 161 longitudinal, lateral and circumferential steel cables, tensioned with jacks applying a force of 1,200 tons stress per cable, to withstand an internal pressure of 427 psi.

The various phases of pressure vessel construction, including site welding of the inner steel lining, pouring of the outer concrete shell and spinning the prestressing cable on the job had to be coordinated carefully. Installation of many structural and mechanical components in the interior of the pressure vessel was necessary before the shell was completed, because afterwards the apertures provided would not be adequate.

Overall tolerances of 0.04 in. were insisted upon in every part of the pressure vessel. This rigid precision had to take account of concrete shrinkage during curing as well as expansion and contraction of metals. To obtain these tolerances, in spite of the staggered schedule for masonry, sheet welding and internal installation, involved considerable coordination among contractors.

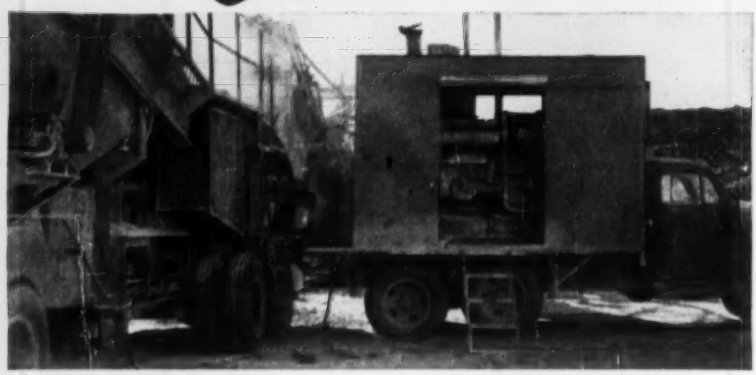
• **Foundation problems**—The alluvial subsoil at Marcoule was rated at 35 psi. Since the completed reactor pile weighs 47,000 tons, the subsoil is expected to settle because of its inadequate bearing capacity. This problem was met by supporting the pressure vessel on a concrete platform, which, in turn, is supported by a battery of hydraulic screw jacks set on a concrete foundation. These jacks will be adjusted to counteract any soil settlement.

G-2 and G-3, identical in all respects, share only external workshops and administrative buildings. Each is housed in a steel frame building 197 ft high, 144 ft wide and 259 ft long. To prevent interference with the simultaneous construction of the reactor pile, these structures were erected in two sections, one in front and one behind the reactor pile. They were then rolled on rails into position and joined over the reactor.

• **The center** is being built and operated by the industrial division of the French Atomic Energy Commission, in consultation with the nuclear energy department of Electricite de France, the national power company.

powering each portable crushing plant

WAUKESHA Diesels



● These two portable crushing plants, shown operating near Appleton, Wis., are *powered for production*—with *Waukesha Diesels*. Both plants and their crushers were built by Highway Machinery Corp., Waukesha, Wis. In the primary-crushing plant (above, right) the 3′ x 10′ Simplicity Vibrating Scalper-Feeder and conveyor are driven by the current from a Waukesha-powered 100 KW generator in the truck (above, center). The 25 x 36 Jaw Crusher is powered by a 148-DKU Waukesha Diesel. This 6-cyl., 5½ x 6-in., 779 cu. in., 155 max. hp unit handles every load demand eagerly and easily, with power to spare. The secondary-crushing plant (above, left) consists of a Double Jaw Crusher with twin 8 x 36 units, a 25″ x 40″ Roll Crusher, a 5′ x 12′ Simplicity double deck Sizing Screen, and conveyors. Its separate, mobile Waukesha power plant is mounted in the truck (shown below) with a 100 KW Generator. This Waukesha NKDBSU Turbo-Supercharged Diesel—6-cyl., 7 x 8¼-in., 1905 cu. in., with counterbalanced crankshaft—drives the two crushers, and powers the generator which supplies current for all incidental equipment. A rugged, compact engine with lively acceleration, clean burning, prompt starting, great overall economy *and* smooth extra power up to 368 hp. Get Bulletins 1634, 1414.

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Men and Jobs

John S. McNown

Kansas University Names New Dean of Engineering

John S. McNown is the new dean of the School of Engineering at the University of Kansas, succeeding T. DeWitt Carr, who is retiring after serving in that post since 1947.

For the last four years, Mr. McNown has been professor of engineering mechanics at the University of Michigan. He received a B.S. degree in civil engineering from the University of Kansas in 1936, an M.S. degree from the State University of Iowa in 1937 and a Ph.D. degree from the University of Minnesota in 1942, after having taught mathematics and mechanics there for five years.

He served on the faculty of the University of Iowa from 1943 to 1952 and was associate director of the Iowa Institute of Hydraulic Research for three years. Since 1949 he also has served as a hydraulic research consultant to the U.S. Bureau of Public Roads and, for the last three years, as a consultant to the Sandia Corp., Albuquerque, N. M.

Careers . . .

Business

Arnold H. Vey and **Robert H. Pearson** have joined the staff of Simpson & Curtin, transportation engineers of Philadelphia.

W. D. Jewett has been appointed director of research and **Gordon Cape** has been named manager of technical research for the Dominion Bridge Co. of Canada.

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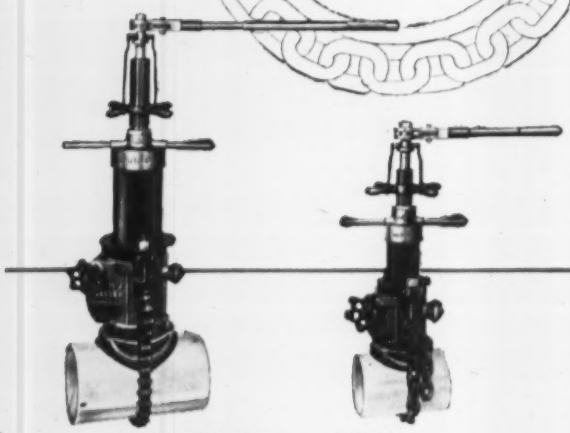

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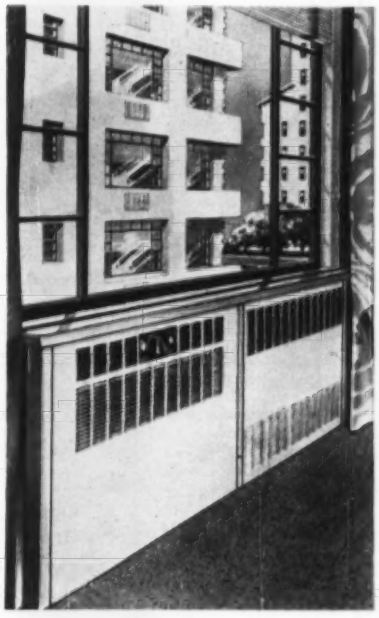


Air Conditioner Fits All Convector Heating Systems

A high-Btu, built-in-wall air conditioner, designed to blend with any type of convector heating units, has been developed by I. W. Air Conditioning Corp.

Known as In-Wall, the conditioner can be used in new or old structures and can be serviced without being removed from its housing sleeve. Each unit has a built in thermostat calibrated in degrees and all components are over-sized.

The conditioners are available in ¾, 1 and 1½ ton sizes. Four centrifugal blower fans move large volume of air at low velocity over the cold coil to reduce noise and drafts. In addition, In-Wall units have a separate exhaust motor and fan to eliminate stale room odors.

The unit extends from the rough floor up to the window sill stool. Enclosures are available for both the air conditioner and convector to form the sill for the window.

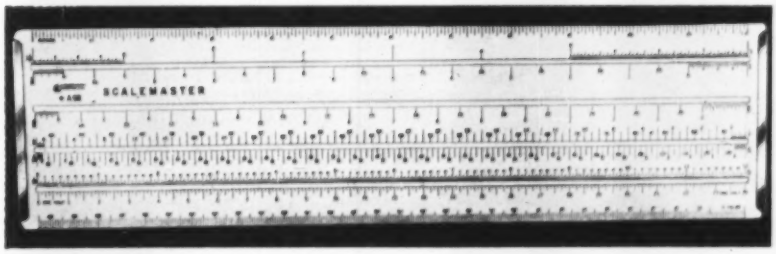
Interior covers can be painted to match any desired wall color. Exterior louvered grilles and trim are aluminum and can be sized to match any brick, marble or metal coursing. I. W. Air Conditioning Corp., 230 Manida St., Bronx 59, N. Y.

Stroke Pump Adjustable While It's In Operation

A 4 in. adjustable stroke diaphram pump can deliver 70 gpm for the simplex and 140 gpm for the duplex model, and adjustments can be made while the pump is in operation, according to the manufacturer.

A standard ball-bearing motor—of ¾ to 1 hp—drives the speed reducer for the unit, which stands 50 in. high. The molded rubber, nylon cord diaphram is clamped in place, so that there are no holes to concentrate stress or weaken it, states the maker. The diaphram assembly can be removed from front or rear of pump by removing four bolts.

The lightweight pump discharge housing has handles for ease in handling. Acid-proof construction is available. Bayonet type or ball valves are optional. Denver Equipment Co., P. O. Box 5268, Denver 17, Colo.



Architect-Engineer Scales Available on Flat Plates

Architects' and engineers' scales are now printed on 12 in. long sheets of flexible plastic. The scales are reinforced at both ends for rigidity and long service.

All scales are exposed to full view on the new Scalemasters, as they are called. The scales have slotted openings, along which the scales are printed, for convenient use. The manufacturer claims no searching or turning is required on the new scales to find the proper scale as is the case with the conventional triangular scale.

The architects' scalemaster has 14 scales and the engineers scale has 9 scales. The C-Thru Ruler Co., 827 Windsor St., Hartford, Conn.

(New Products continues on page 88)

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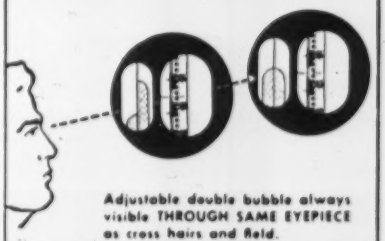

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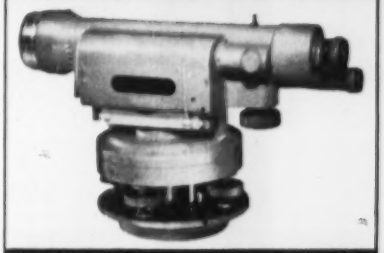

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By removing the excess water in the raw sludge the Densludge Thickener reduces by one half, or more, the volume of raw sludge to the Digester. In the Digester, high capacity draft tube mixers insure full capacity utilization by maintaining homogeneous conditions throughout the tank. These reductions in sludge volume can now be directly translated into reductions in overall digester capacity requirements.

For more complete information on The Dorrco Densludge Digestion System, write for a copy of Bulletin No. 6262, Dorr-Oliver Incorporated, Barry Place, Stamford, Conn.

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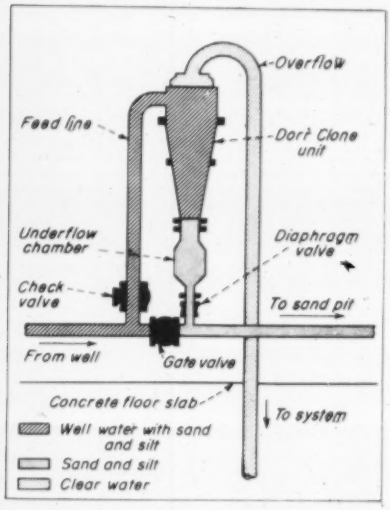

Vortex Desanding System For Well Water Unveiled

Dorr-Oliver took the wraps off of its new DorrClone desanding system for water supplies at last month's American Water Works Association convention in Atlantic City.

The system consists of a vortex separator and an underflow chamber as shown in the diagram. Feed enters tangentially in the upper section of the separator and maintains a vortex action. Centrifugal force throws sand and silt in the raw water to the outside walls of the cone, where they pass downward into the underflow chamber. Desanded water moves to the inner spiral of the vortex and out into the supply system.

The underflow chamber is necessary in a pressure system. It merely catches the sand, which is periodically drained.

The separator unit is basically a classifier that will make a separation of particles somewhere between 500 and 200 mesh; essentially all (about 98.5%) of the solids larger than the separation size will end up in the underflow chamber, according to tests. A test installation at Hobbs, N. M., using a 24 in. desanding unit, removed 673 lb of sand per day from a 1.26 mgd average flow.

DorrClone units are available in diameters of 6, 12 and 24 in. Either positive pressure or atmospheric pressure on the overflow can be provided, with the former more common. Maximum inlet pressure varies between 60 and 150 psig, and pressure drop through the unit, between 5 and 20 psi, depending on the diameter of the vortex finder. — DORR-OLIVER, INC., BARRY PLACE, STAMFORD, CONN.

(*New Products continued on page 90*)

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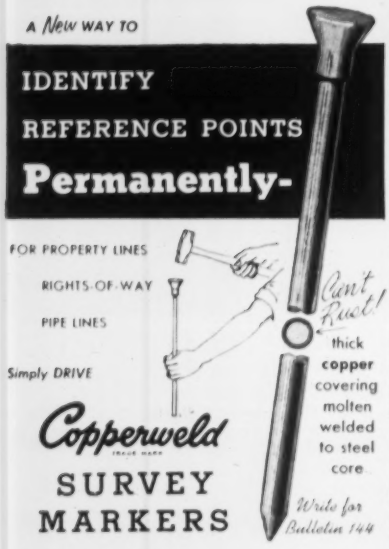

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Furnished in any desired length—in multiples of 6 inches. Packed 10 markers to a carton.

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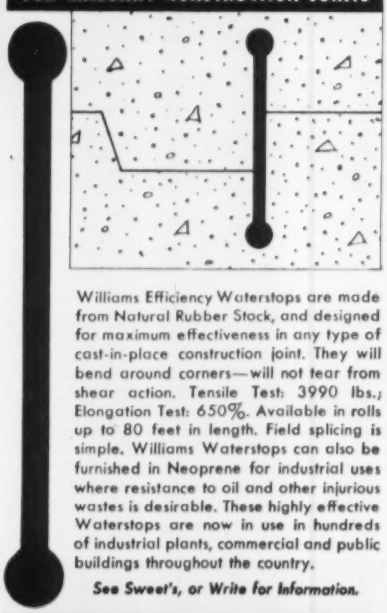
WIRE AND CABLE DIVISION Glassport, Pa.

RUBBER WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



Williams Efficiency Waterstops are made from Natural Rubber Stock, and designed for maximum effectiveness in any type of cast-in-place construction joint. They will bend around corners—will not tear from shear action. Tensile Test: 3990 lbs.; Elongation Test: 650%. Available in rolls up to 80 feet in length. Field splicing is simple. Williams Waterstops can also be furnished in Neoprene for industrial uses where resistance to oil and other injurious wastes is desirable. These highly effective Waterstops are now in use in hundreds of industrial plants, commercial and public buildings throughout the country.

See Sweet's, or Write for Information.

WILLIAMS
EQUIPMENT and SUPPLY CO.
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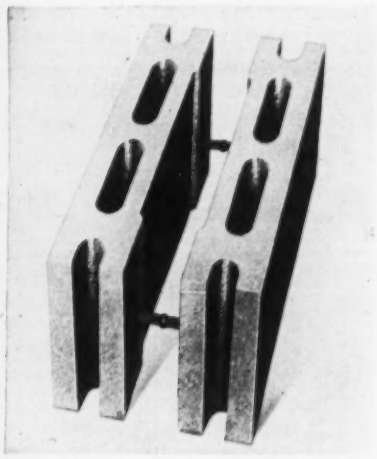


Iron Ties Join Two Blocks, Make Twin Wall Block Unit

Corrosion-resistant iron ties join two separate, cored blocks to produce a concrete, twin wall block unit designed for double-wall construction.

The Pacer block, as it is called, is manufactured as a unit, the 8 x 8 x 16 size weighing about 37 lb. The blocks also can be produced in 4 and 12 in. heights with special molds.

The manufacturers claim tests for compressive strength show the block can be used for multi-story construction, the iron ties adding to the shock resistance of the block and helping to prevent cracking under heavy loads.

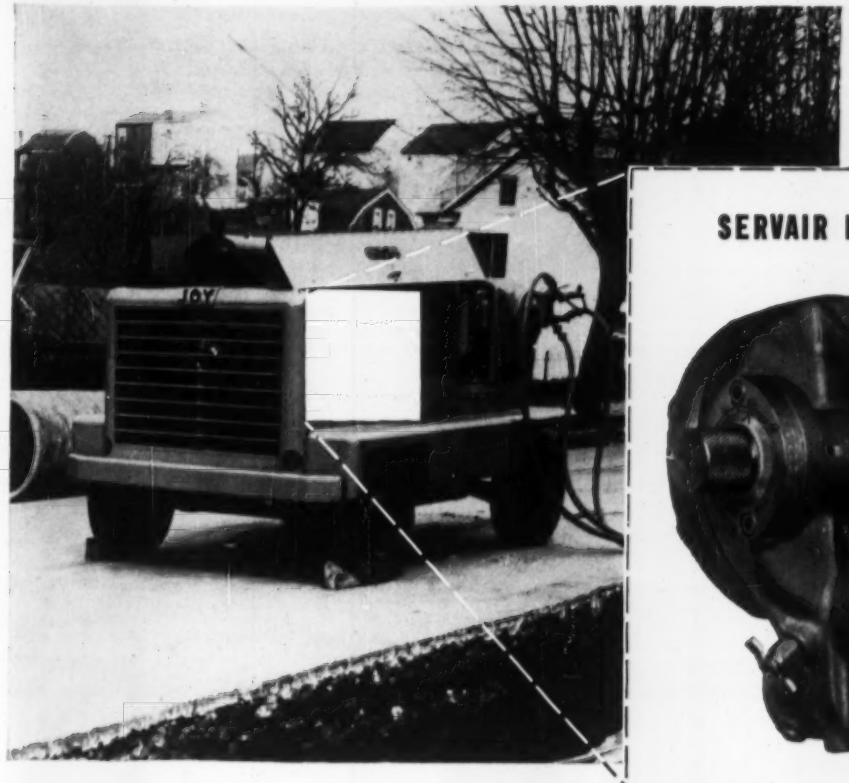
It is said that the cored blocks and between-block air cavity provides good insulation against temperature, sound and humidity. Plastering veneering or painting can be done directly on the face of any Pacer block wall. PRESTO BRICK MACHINE CORP., EMPIRE STATE BUILDING, NEW YORK 1, N. Y.

Foamed Concrete Is Made By Adding Aluminum

Durox, a foamed concrete used to produce lightweight concrete products, will be produced at a plant in Denver.

The foamed concrete is made the same as ordinary concrete except that powdered aluminum is added to cause the mixture to rise. The manufacturer claims the foamed concrete can be sawed, nailed, bored and hewn with common woodworking tools: also, the concrete is unaffected by rot, termites and fungus and is highly resistant to water absorption.

Developed and used in Sweden for years, the foamed concrete will be manufactured under license from SWEDISH-AMERICAN INDUSTRIES, INC., 3395 S BANNOCK ST., ENGLEWOOD, COLO.



SERVAIR DEMAND CONTROL

ONLY JOY AIRVANE PORTABLE COMPRESSORS

HAVE THIS NEW FOOL-PROOF LOAD CONTROL

The new Servair Demand Control takes the mystery out of pressure setting . . . makes it as simple as turning up the furnace thermostat at home. You just set the dial for the pressure you need and the Joy Airvane Rotary will deliver it.

The Servair is a true "demand" load control because it matches compressor output to demand . . . from 0% to 100% capacity. The control maintains steady air pressure regardless of the number and size of tools cutting in and out during operation, yet runs the engine only fast enough to meet the demand for air. This gives you top fuel economy and a minimum of wear and tear on the engine and compressor.

Joy Airvane Rotaries have many other features that make them trouble-free:

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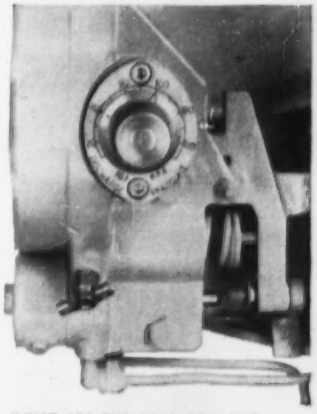
DIRECT DRIVE—efficient spline coupling eliminates clutch (and clutch maintenance).

READY ACCESSIBILITY—to controls and items normally requiring regular maintenance.

You should get the whole story on Joy Airvane Portables before you consider *any* new compressor. Write ***Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.*** *In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



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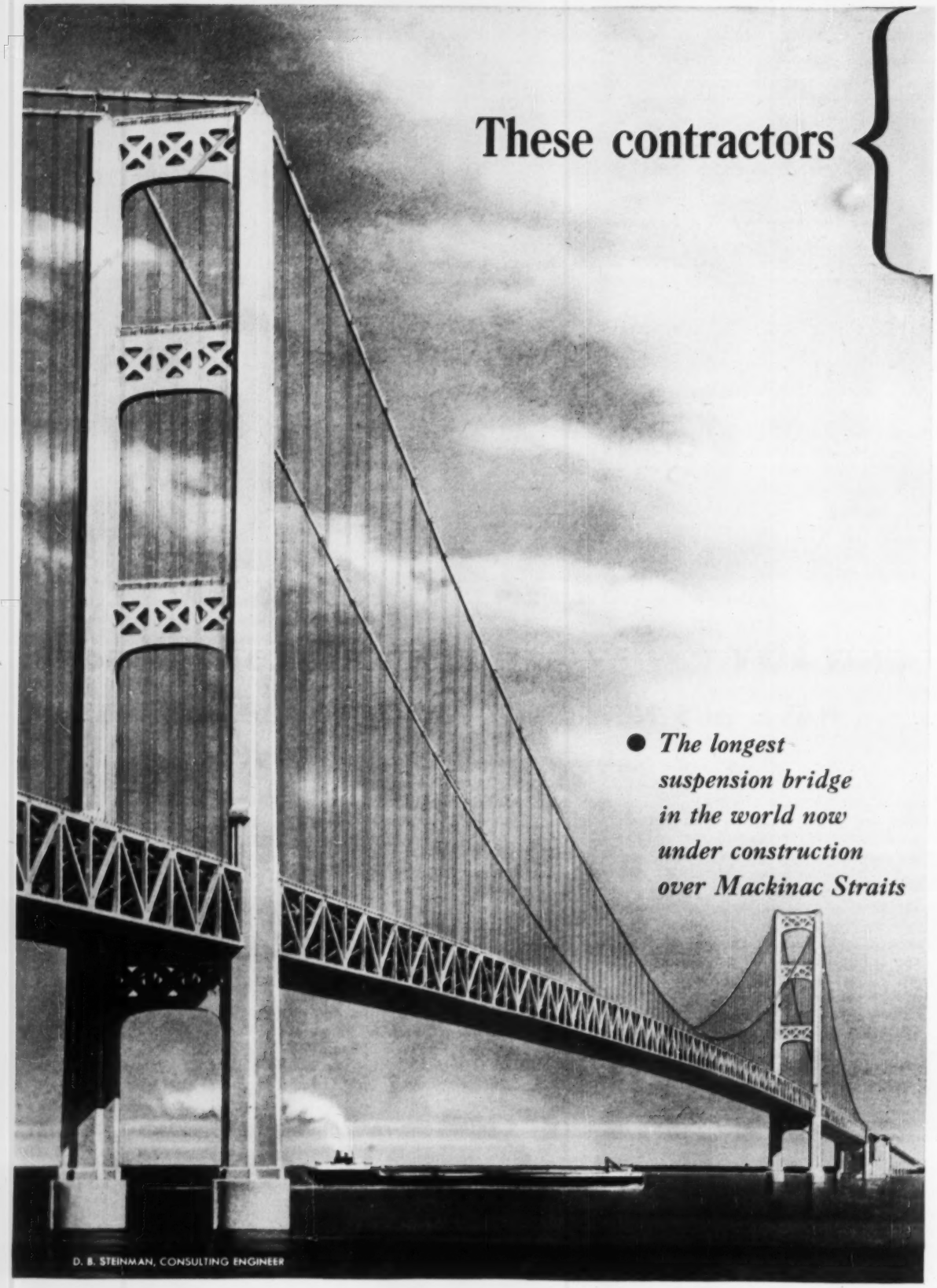
WRITE FOR FREE BULLETIN 181-24


These contractors
● The longest suspension bridge in the world now under construction over Mackinac Straits
D. B. STEINMAN, CONSULTING ENGINEER

Merritt-Chapman & Scott Corporation and American Bridge Division of U. S. Steel Corporation

use Shell Lubricants in the construction equipment on Mackinac Bridge project

Today's engineering knowledge and modern construction equipment are making the mighty Mackinac Bridge a reality. This equipment requires oils and greases which will remain stable and give adequate lubrication at extreme temperature ranges. To keep their heavy-duty machines operating at maximum efficiency with a minimum of down time, both companies, Merritt-Chapman & Scott Corporation and American Bridge, chose Shell Lubricants and Fuels.

The Mackinac Bridge project is just one of the many construction operations where equipment was lubricated and protected by Shell products. Wherever *heavy-duty* equipment operates, Shell Lubricants and Fuels are being used to keep machinery in top operating condition and hold maintenance costs down. Perhaps it will pay you to investigate the savings that can be realized through the use of Shell Industrial Lubricants and Fuels.

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Industrial Lubricants	Outboard Motor Oil

and many other fuels and lubricants

American Bridge Division of U. S. Steel Corporation has strung a total of 12,500 tons of cable as part of the 66,500-ton superstructure.

One of the 34 piers of the bridge substructure built by Merritt-Chapman & Scott Corporation

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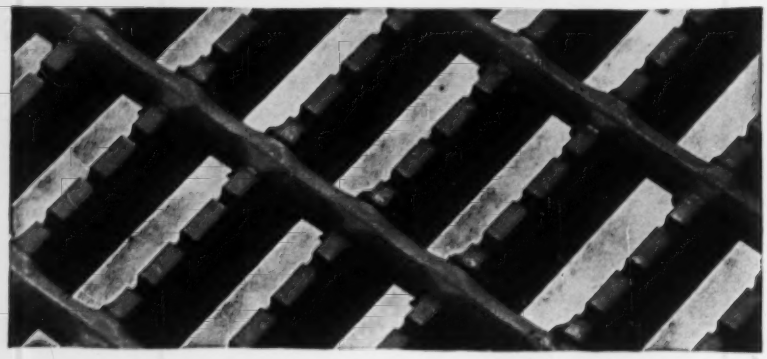

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Obituaries

Fred A. Stanley, 73, construction contractor, died May 31 at Beaver Dam, Ky. He was a native of Ohio County.

Paul J. Neff, 72, board chairman and past president of the Missouri Pacific Railroad, died June 8 in St. Louis. A University of Kansas graduate, Mr. Neff started as a rodman with the Frisco Railroad and became construction engineer and eventually chief engineer. In 1922, he moved to the International-Great Northern Railroad as assistant to the president and was named assistant executive vice president three years later. The Missouri Pacific took over I-GN, and transferred Mr. Neff to the parent company in 1926 as general superintendent of its Eastern operating district. He then climbed through executive jobs in four of the railroad's major departments—engineering, operating, traffic and executive. In 1943 he became senior executive assistant, and in 1946 chief executive officer.

Nicol MacNicol, municipal engineer of Forest Hill Village, Toronto suburban community, died June 2 in Toronto. A graduate in civil engineering of the University of Toronto in 1919, he began his professional career at Windsor, Ont., then moved to Detroit and became engineer of Forest Hill Village in 1933. He was past chairman of the Engineering Institute of Canada and of the Waterworks Association of Canada.

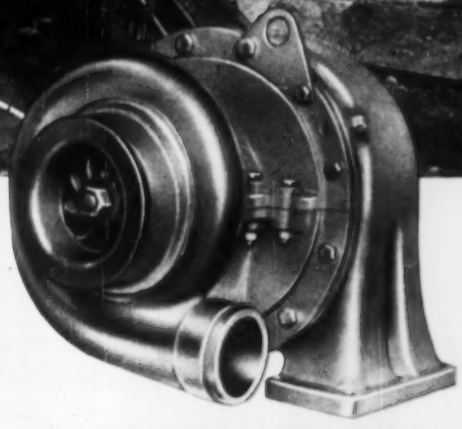
Wendell W. Chaffin, 78, former city engineer and city manager of Sanford, N. C., died June 16. A graduate of Ohio State University, Mr. Chaffin moved to Sanford in 1923 as resident engineer for a construction company that held contracts for municipal improvements.

Laurie O. Newsome, 62, topographic engineer with the U. S. Geological Survey until his retirement in 1948, died in Sacramento, Calif., June 9. He worked for the survey since 1921, in all the western states and Alaska.

Prof. Carleton T. Bishop, 74, who had taught civil engineering for 43 years at Yale University before his retirement in 1952, died June 10 in New Haven, Conn. At the time of his death Professor Bishop was president of the city's Board of Park Commissioners and also a consultant for the engineering firm of Westcott & Mapes. His early work after graduation from Yale had been with the American Bridge Co. While teaching he also did consulting work for the university, and in this capacity was active in design of the Yale Bowl.

AIRESEARCH TURBOCHARGERS BOOST INTERNATIONAL HARVESTER DIESEL POWER RATINGS

AIRESEARCH TURBOCHARGED *International Harvester UDT 1091 diesel is used to power this rock crushing equipment 5000 feet high at Pueblo, Colorado. Rock crushed is from 10 inches maximum to one inch minus with a 40% crush. The AiResearch turbocharger has increased the rock crusher's production by 20%, and not only boosted horsepower 20 – 30% over the diesel's previous output at that level but actually raised it over its sea-level rating. Approximately 1800 tons of rock are being crushed in eight hours by the turbocharged UDT 1091 compared with 1400 tons in an equal period with a non-turbocharged unit. The AiResearch turbocharged UDT 1091 prevents stalling under heavy loads and has operated for over 2500 hours at elevations in excess of 5000 feet with no "down time."*



AIRESEARCH C-60 TURBOCHARGER NOW AVAILABLE ON INTERNATIONAL HARVESTER UDT 1091 DIESEL ENGINE

Installation maintains sea-level output up to 12,000 feet with an important decrease in fuel consumption

AiResearch turbochargers have an outstanding record of operation in the field. Features include turbine wheels of unmatched efficiency, air-cooling which eliminates the need for complicated plumbing and ease of installation and maintenance. Thermal loading on the engine is lower by comparison than any other turbocharging or supercharging installation. Your inquiries are invited.

BASIC SPECIFICATIONS FOR AIRESEARCH TURBOCHARGERS					
MODEL	F-51	C-60	A-60	E-100	B-100
Diameter — in. nom.	10	11.5	15.25	15.1	15.4
Length — in.	10.5	12.9	16.75	14.7	17.1
Weight — lb.	40	95	125	112	135
Output — lb/min. (Standard Conditions)	29-51	30-60	38-60	50-100	60-100

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AiResearch Industrial Division

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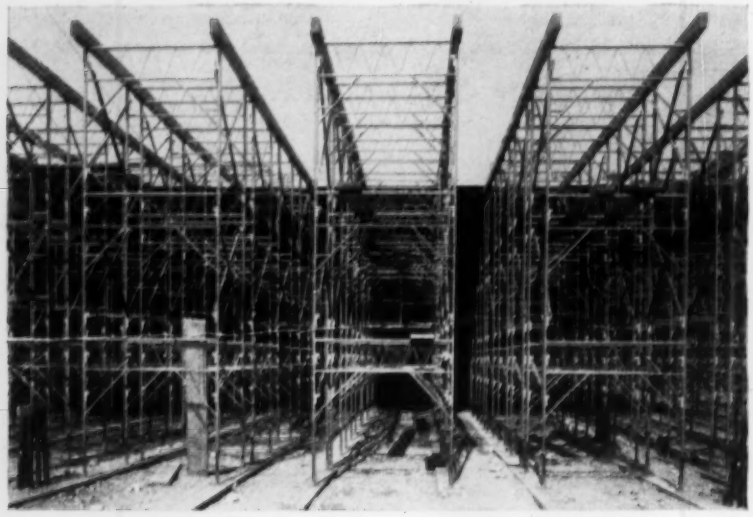
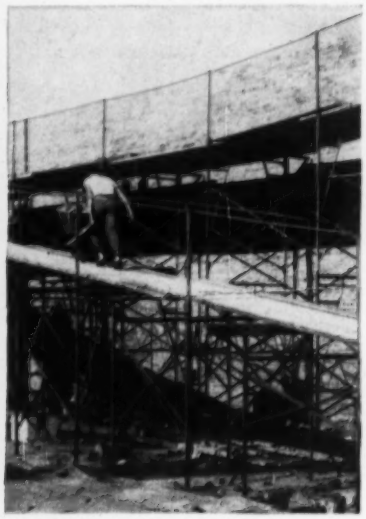
DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

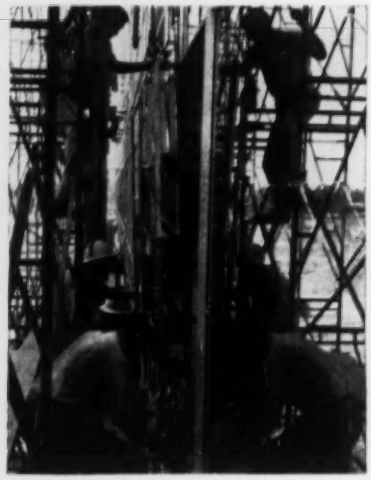
Scaffolding Methods . . . by Patent Scaffolding Co.



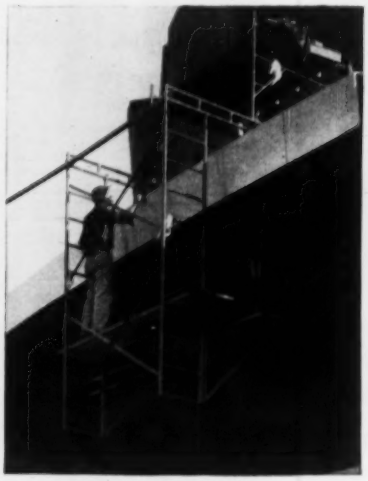
PREFAB SHORING FOR 12" SLAB—On a new 150' x 350', two-story building for Polaroid Corp., Waltham, Mass., general contractor Aberthaw Const. Co. needed support for a 12" slab. 4000 "Trouble Saver"® Shoring frames assembled in rows 3' and 3'6" apart easily provided for it. Job supt., Al Parsons, Jr.. says "We found these shoring frames, braces and components very easy to handle. We know that this type of shoring goes up faster, cuts costs and gives us maximum access to the base slab for other work".



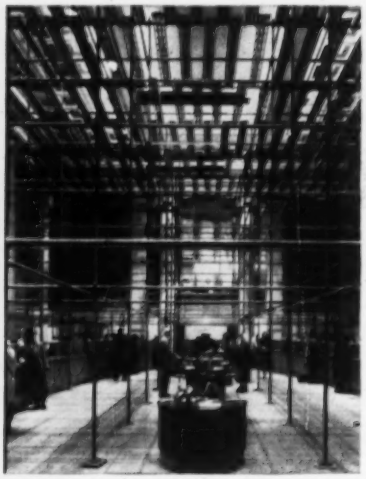
DOUBLE-DUTY—Both the wheeling ramp and the mason's platform in back are made from prefab sections of "Trouble Saver Scaffolding. Varying-height frames and adjustable legs achieve the slope. Terminal Construction Co., Woodridge, N. J., general contractor.



GLASS SETTING RIG—A special rig, developed by Pittsburgh Plate Glass Co., with 700 "Trouble Saver" Scaffolding frames for working platforms, places 8' x 11' glass panes for Conn. Gen. Life Ins. Co. new building, Hartford. Eight rubber cups grip panes, overhead crane lifts to position. Turner Construction Co., general contractor.



ROLLING SCAFFOLD—Unusual set-up is made of two 5'-wide, counterweighed "Trouble Saver" Scaffolding frames on casters. 12'-trusses are attached and ladder frames hang below. Sidewall brackets make two-level platforms. Scaffold rolls around roof perimeter of new Dallas Memorial Auditorium. R. P. Farnsworth & Co., gen. contr.



BANKING AS USUAL—Smoke damage due to fire made a wash and paint job necessary at the Marshall and Isley Bank, Milwaukee. Painting contractor, Carl L. Ruhland, used "TubeLox"® Scaffolding with Featherweight Stages to provide working platforms for ceiling and high wall work above and to permit banking traffic as usual below.

To help you with your scaffolding and concrete shoring methods, PS offers a complete nation-wide engineering service available to you locally. See the Yellow Pages in your 'phone directory for the nearest Patent Scaffolding office or representative that **sells** and **rents** "Gold Medal" Scaffolds.

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Request for Estimate

Invitation to bid is not agreement to subcontract

The mere fact that a contractor, who plans to submit a bid for a prime contract, asks another contractor to submit a bid for the performance of a part of the work, does not in itself constitute an agreement to subcontract that part of the work to the other contractor in the event the general contract is awarded to him.

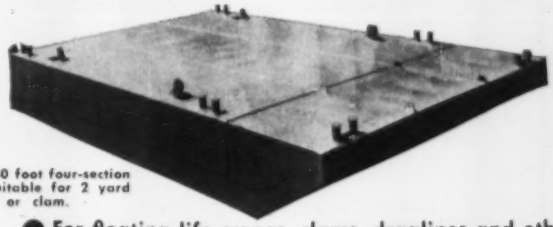
However, where the contractor who contemplates submitting a bid for the general contract asks another contractor to submit a bid for the performance of a part of the work and agrees to award the subcontract for the performance of that part of the work if he uses the bid and is awarded the contract, such agreement is enforceable, and the failure to live up to the agreement constitutes a breach of contract.[1]

"It is the accepted practice of the trade to have a general contractor solicit estimates from more than one sub-contractor. It is elementary that a general contractor's request for an estimate based on certain plans and specifications creates no obligation on the part of the general contractor to accept the estimate unless such has effectively been agreed in an express pledge or stipulation—oral or written—at the time the estimate was requested by the general contractor. The estimate submitted is the first offer and its acceptance is necessary to create a contract of any kind between the parties. The party who submits the bid is deemed to do so for his own advantage in the hope or expectation that a contract may be secured and if his estimate is not accepted he does not have any recourse against the party who requested the estimate to recover the reasonable value of the time and labor expended in examining the plans and specifications and arriving at the estimate. (Northeastern Const. Co. v. Town of North Hempstead, 121 App. Div. 187, 105 N. Y. Supp. 581; Topping v. Swords, 1 E. D. Smith 609; Soper v. Buffalo & Rochester R. R. Co., 19 Barb. 310)."[2]

The fact that the party for whom the work is being done objects to the subcontractor the prime contractor has agreed to use does not relieve the prime contractor from his obligation to the subcontractor or his liability for damages for breach of contract.[3]

"Generally speaking, it may be said that where a party undertakes expressly for the performance of some act, his

MANITOWOC
SECTIONAL BARGES



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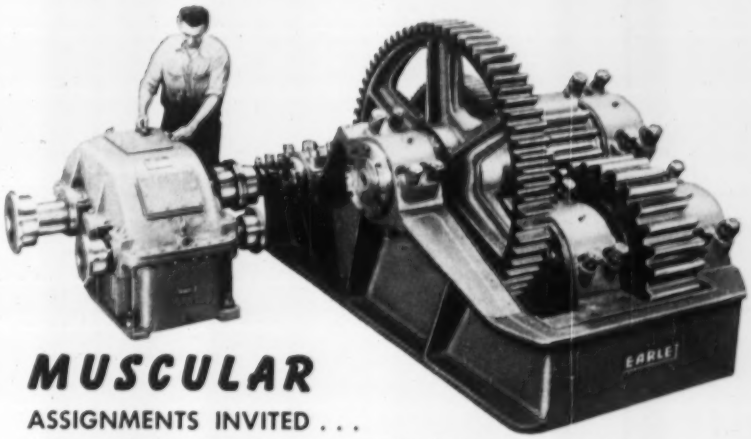

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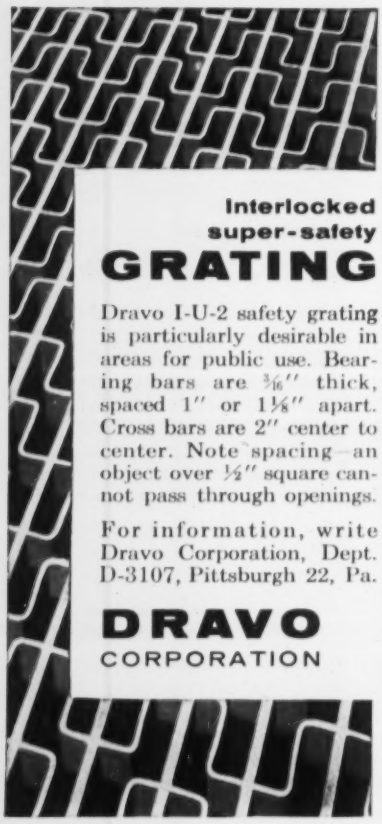
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positive engagement casts upon him a duty, the discharge of which cannot be excused by showing his inability by reason of lawful interference by some third person. By neglecting to qualify his contract, so as to make such an excuse available, he waives it as a defense against a recovery of damages for nonperformance."[4]

(1) Northwestern Engineering Co. v. Ellerman et al., 10 N.W. 2d 879; Fichter Steel Corp. v. P.T. Cox Const. Co., 42 N.Y.S. 2d 255, 266 App. Div. 347; R.P. Farnsworth & Co., Inc. v. Albert, 79 F. Supp. 27.
(2) John Milnes Co., Inc. v. Certified Const. Co., N.Y.L.J., June 26, 1951, p. 2358.
(3) Herman Co. v. Gallagher Electrical Co., 138 N.E. 2d 120.
(4) 6 R.C.L., page 1016.

Special Contract Clauses Governing Rights of Sub

A subcontractor's liability for delayed performance and his right to final payment can be controlled by special contract clauses.

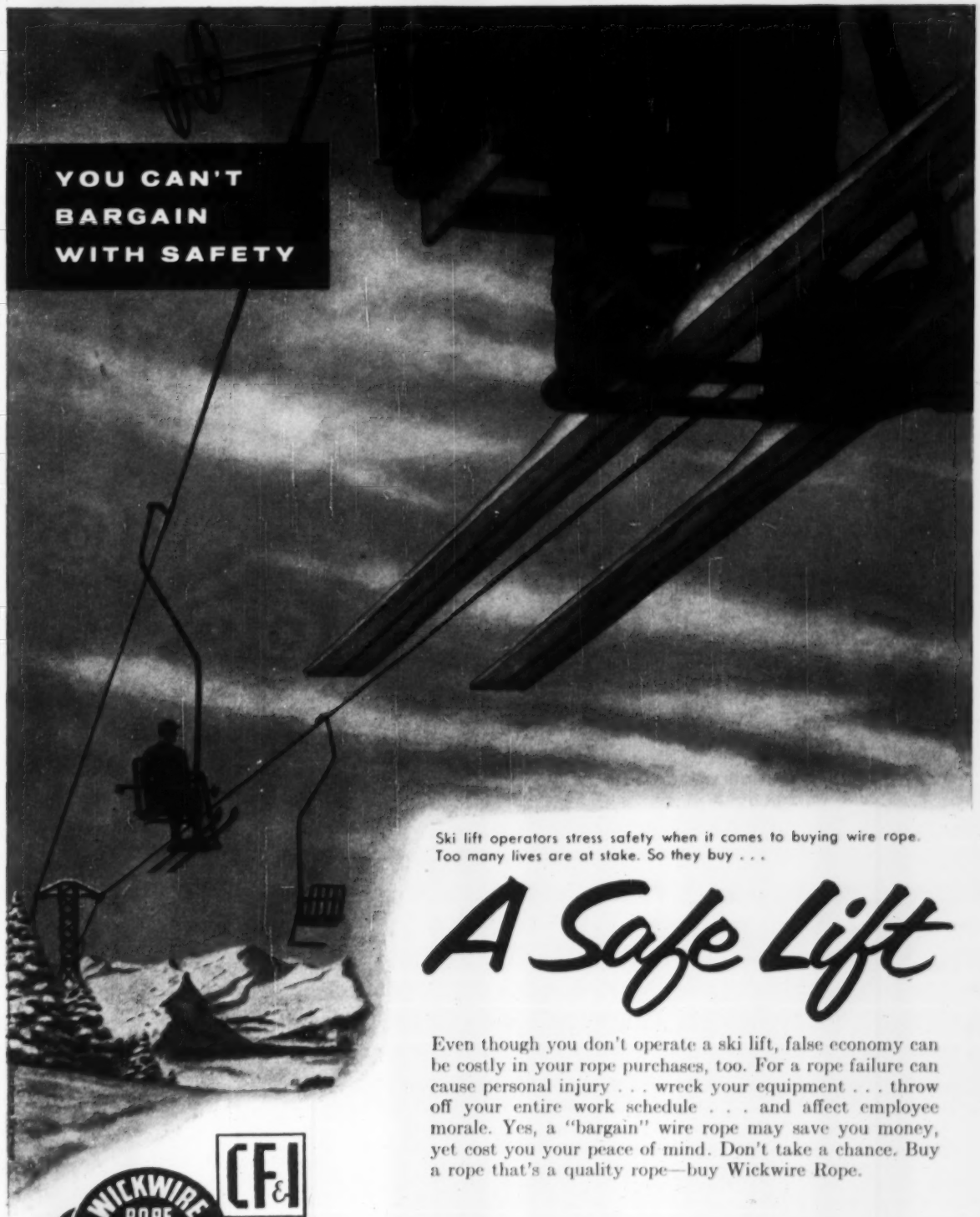
Both situations are illustrated by an Arkansas case in which a subcontractor sued a general contractor for the balance due under the subcontract.

The general counterclaimed for liquidated damages at the rate of $15 per day for delayed performance of the subcontract claiming that the subcontract had not been performed within the time stipulated in the subcontract.

The subcontract provided that "no liquidated damages shall be chargeable against the party of the second part (subcontractor) for the failure to complete said work within the time allotted unless such failure to complete the tunnelling works delays the final acceptance of the project covered by the principal contract."

The court found as a fact that completion of the prime contract was not in any way delayed by failure on the part of the subcontractor and that under the express terms of the contract, the prime contractor could not recover any damages for delayed performance from the subcontractor. This judgment was affirmed on appeal.[1]

The general contractor also interposed the defense that the subcontractor was not entitled to final payment until the prime contractor had received his final payment. As to this contention, the court held that the right of the subcontractor to payment for the work done depended upon the terms of the contract, and that in the absence of a provision in the contract to the effect that the subcontractor will not be paid in full until the prime



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A Safe Lift

Even though you don't operate a ski lift, false economy can be costly in your rope purchases, too. For a rope failure can cause personal injury . . . wreck your equipment . . . throw off your entire work schedule . . . and affect employee morale. Yes, a "bargain" wire rope may save you money, yet cost you your peace of mind. Don't take a chance. Buy a rope that's a quality rope—buy Wickwire Rope.

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Firestone Tubeless Rock Grips are making big news wherever heavy equipment rolls. Two great tread designs match toughness with traction to move your heavyweights over any course. Rock Grip construction eliminates your need to change tires to match terrain. It delivers the full flotation you need for sand and soft stuff. It also has the armored grip necessary to negotiate rock-hard runs over broken shale. Safety-Tensioned *Gum-Dipped*® nylon bodies and cut-resistant treads make these Firestones first choice tires with men who move equipment. Your Firestone Sales Engineer can demonstrate why you'll make them your first choice, too. Contact him today—through your local Firestone Dealer or Store.

ROCK GRIP WIDE BASE ROCK GRIP

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Firestone

BETTER RUBBER FROM START TO FINISH

contractor has received full payment for the performance of the prime contract, the subcontractor was entitled to payment when he had fully performed his contract.

(1) Trinity Universal Insurance Co. v. Robinson, 299 S.W. 2d 833, Supreme Court of Arkansas, March 4, 1957.

The Law Does Not Permit Oral Change in Contract

In the absence of fraud or mistake, oral or extrinsic evidence is not admissible to alter or contradict the terms of a written contract.

"A complete written agreement merges and integrates all the pertinent oral negotiations occurring at the time of or prior to its execution and ordinarily may not be varied or contradicted by parol evidence. Supreme Woodworking Co., Inc. v. Zuckerberg, 107 A. 2d 287; Quinn v. Bernat, 80 R. I. 375, 97 A. 2d 273."[1]

The court, in the Zuckerberg case, stated: "While it is true that parties to an existing contract may by mutual consent modify or change it by altering or excising certain of its provisions or by adding new provisions and that this may be done orally even though the original contract be in writing if based on proper consideration, the evidence in this case in my opinion falls far short of establishing any such mutual consent by the parties based on proper consideration to modify their existing written contract as claimed by the defendant."

(1) Bohlinger v. Kagan, 147 F. Supp. 910, U.S. District Court of Rhode Island, Dec. 31, 1956.

No Liability for Defects Caused by Specifications

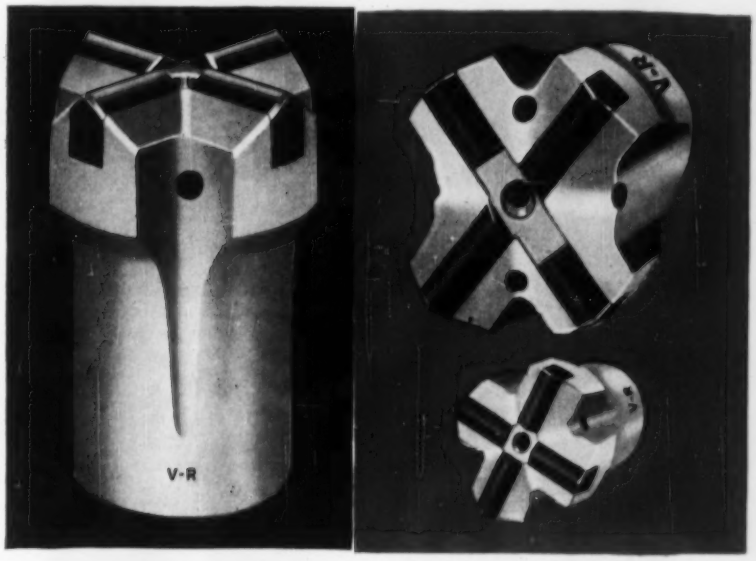
A contractor is not liable for defects that develop in a job when the defects are due to defective plans and specifications.

In a lawsuit between a painting subcontractor and a general contractor, for example, the sub sought compensation for extra work, claiming he had to repaint part of the work because of faulty specifications.

The court held that if the work had to be redone because of faulty specifications, the subcontractor was entitled to be compensated for such extra work. However, the burden was on the subcontractor to prove that the defective work did not result from improper workmanship, but as a result of faulty specifications.[1]

(1) Ramey v. Marshall, 279 S.W. 2d 382.

1500% INCREASE
in demand for V-R bits
in six months time



Here are the reasons given by users:

LONGER CARBIDE LIFE
"Up to 3 times the footage in our granite quarry."
"As much as twice the life on this tunnel job."
"75% more footage on road job."

LESS GRINDING
"150 feet more per grind."
"Sharpened other bits every five feet, V-R bits lasted ten feet in hard granite."

LESS INSERT BREAKAGE
"Broke inserts in 17 out of 25 bits of another make, only 1 out of 25 V-R bits."

LESS BODY FAILURES
"Seldom encounter ring-off with V-R bits."
"Excessive body breakage eliminated since buying your bits."

COMPLETE LINE
"You have had every bit size or type we have needed."

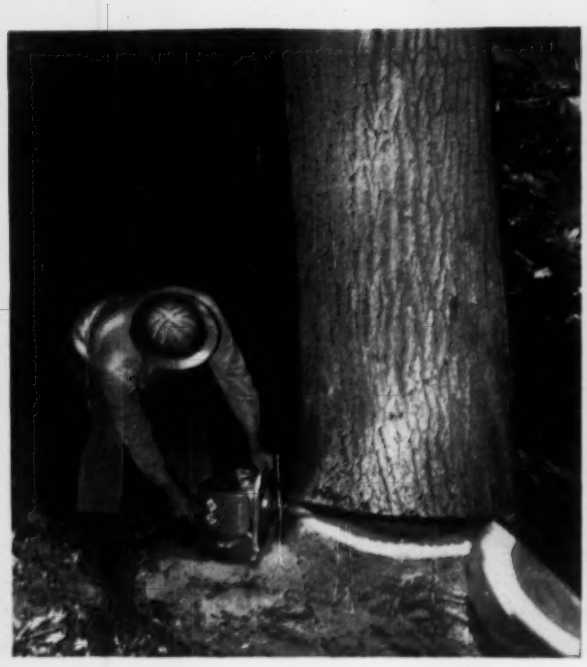
Buy the bits that are beating them all: V-R bits—proved best by test.

SEND FOR LITERATURE covering V-R bottoming type, shoulder type and push-on bits.

M-634

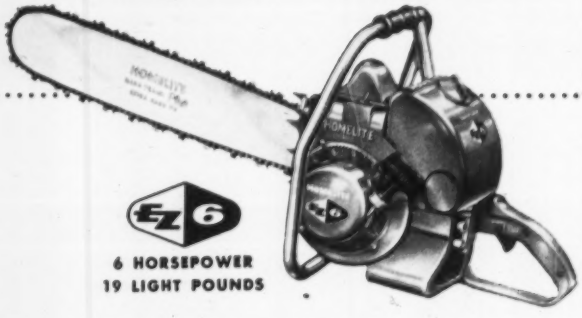
Manufacturers of Cemented Carbides . . . Rock and Mining Bits

Vascoloy-Ramet Corporation
SUBSIDIARY OF FANSTEEL METALLURGICAL CORPORATION
892 Market Street • Waukegan, Illinois



Choose from Two NEW HOMELITE CHAIN SAWS...

the 6-Horsepower "Power Twins"



The Homelite EZ-6
DIRECT DRIVE CHAIN SAW

Fastest-cutting direct-drive chain saw made, the 6 horsepower of the EZ-6 makes quick work of trees up to 5 feet in diameter. Famous Floating Power and a light 19 pounds make the EZ-6 easiest of all to handle. Ideal for clearing building sites, repairing storm damage, maintaining rights-of-way.

EZ 6
6 HORSEPOWER
19 LIGHT POUNDS

The Homelite 6-22
GEAR DRIVE CHAIN SAW

Most versatile chain saw you can own, the 6-horsepower, 22-pound 6-22 does everything. Brings down big trees, up to 7 feet in diameter. Built to rugged professional standards, the smooth-operating 6-22 stands up under the grind . . . day in and day out. Money-saving attachments convert the 6-22 in seconds to plunge-cut bow, brush-cutter or clearing attachment. Does any woodcutting job for contractors, road builders, utilities, tree surgeons, park commissions.

6 22
6 HORSEPOWER
22 LIGHT POUNDS

WIN A FREE CHAIN SAW EVERY YEAR FOR LIFE... IT'S EASY!

Nothing to buy, nothing to write, no obligation. Just have a free demonstration of the new Homelite Power Twins. You may have three chances to win! GRAND PRIZE: a free Homelite chain saw every year for life, PLUS 25 chain saws given away by Homelite District Offices, PLUS hundreds of chain saws being awarded by Homelite dealers in their own local contests. Register now! Limited to residents of the United States and subject to local state, county and city laws.

HOMELITE
PORT CHESTER, NEW YORK

A DIVISION OF TEXTRON INC.
1107 RIVERDALE AVENUE, PORT CHESTER, NEW YORK

Homelite Builds and Sells More Chain Saws than any Other Company in the World
Manufacturers of Carryable Pumps • Generators • Blowers • Chain Saws

Waterworks Reservoir in Indiana Requires Dam

This $415,000 impounding reservoir for Kokomo Waterworks Company in Indiana involves temporary diversion of Wildcat Creek and construction of a gravity concrete spillway 500 ft long, earth embankment 1,240 ft, and supplemental fuse plug (embankment) 400 ft. Height varies up to 17 ft. American Water Works Service Company, Inc., Philadelphia, Pa. is the engineer.

The owner furnishes 16 in. and 36 in. cast iron pipe and sluice gates with operators. All other materials are supplied by the contractor. Concrete must test at 3,500 lbs per sq. in.

Wages include: tractor operators $3.10, roller operators $2.70, truck drivers $2.25 and common labor $1.95 plus 7.5¢ per hour welfare fund.

The bidders include:

1C Tousley Construction Co., Inc., Indianapolis, Ind $415,133
2 J. L. Simmons Co., Indianapolis, Ind 445,951
7 Ted D. Anderson Construction Co., Kokomo, Ind 658,514
EE American Water Works Service Company, Inc., Philadelphia, Pa 445,000

Bids: 3-22-57 Items	Unit	Quantity	Unit Prices 1C	2
Diversion, Wildcat Creek	ls	1	$14,700	$41,413
Clear & grub dam area	ac	20	130.00	55.00
Excavation & stripping	cy	13,000	0.75	0.70
Embankment, rolled random	cy	27,500	0.80	0.60
& earth blanket, rolled sel.	cy	27,000	0.80	0.69
Riprap, 8" on 4" cr stone	cy	2,300	5.20	7.40
Rock toe, ft of dwnstrm slope	cy	1,950	5.20	5.85
Rock fill & grtg under conc apr	cy	1,200	5.20	5.85
Riprap paving	cy	6,250	5.28	5.30
Drains, 12"	lf	600	4.00	3.45
8"	lf	500	2.00	3.20
6"	lf	600	1.60	3.20
4"	lf	400	1.25	1.60
4" undr conc apron	lf	1,000	1.60	2.12
Manholes	ls	job	450.00	690.00
Bedding matl, for drains	cy	580	6.00	4.50
Steel, reinf	t	110	280.00	277.00
Concrete, type A	cy	1,100	51.00	52.00
B	cy	4,100	33.00	33.00
C	cy	870	31.00	31.00
Cement mortar grouting	cy	580	34.00	41.00
Expansion joints	lf	150	6.50	7.00
Sluice gates, install	ls	job	185.00	376.00
CIP, install	ls	job	110.00	490.00
Pipe tubes for sluice gt stems	ls	job	13.00	
Handrailing	lf	150	8.00	9.00
Flashboards	ls	job	1,880	2,000

Completion schedule: 4-10-57 to 8-31-57

Concrete Lined Canal in Jackson County, Oregon

This 11.8 mile, Howard Prairie delivery canal goes through heavily timbered country at an elevation of 4400 where access roads are few and poor. Winter weather will shut down work from November to April. The $1,636,739 joint venture contract to Cherf Brothers, Inc., Sandkay Contractors, Inc., and S. Birch & Sons is with the Bureau of Reclamation, Department of Interior. J. A. Callan is construction engineer at Camp White, Oregon. F. J. O'Connor is office engineer, J. L. Hatch, field engineer, W. Johnson, resident engineer.

Close bidding put the low only 1.8% under the second bid, but almost 30% over the estimate.

The canal will have trapezoidal, rectangular and cut-and-cover sections. Related structures include a bridge, drain inlets, one 48" siphon half a mile long, wasteways and one small diversion dam. It will carry water from a storage reservoir to a power plant and thence to an existing irrigation system.

Cement to be paid for as a separate item is Type II-low alkali. All materials are to be furnished by the contractor.

Wage rates as required by the Davis-Bacon Act include carpenters $2.90, general laborers $2.35 including walking wheelbarrow power type, powdermen $2.70, riprap men $2.35 to $2.55, dump truck drivers, 6-yds and under $2.50, over 30 yds $3.00. Power equipment operators range from $2.42 for a cherry picker operator to $3.38 for power shovels or cranes of 5 cu yd and over.

Key personnel for the contractor include L. J. Curtis, project manager, Lloyd Belz, project engineer.

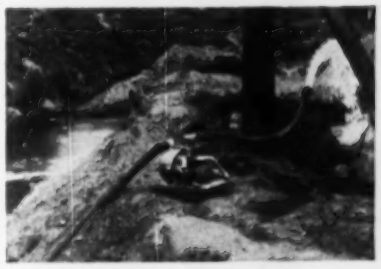
The three bidders were:

C1 Cherf Bros Inc & Sandkay Contrs, Inc & S. Birch & Sons Constr Co, Ephrata, Wash $1,636,739
2 Peter Kiewit Sons' Co, Medford, Ore 1,666,153
3 Mountain States Construction Co., Denver, Colo 1,953,584
EE Bureau of Reclamation, Camp White, Ore 1,267,685

Bids: 4-25-57 Items	Unit	Quantity	Unit Prices 1C	2
Exc, comn, canal 1st 40Mcy	cy	40,000	$3.28	$2.75
over 40Mcy	cy	17,600	0.60	2.50
rock, canal 1st 50Mcy	cy	50,000	3.90	2.75
over 50Mcy	cy	75,000	2.30	2.50
common, structures	cy	1,070	2.35	8.00
rock, structures	cy	2,400	4.77	8.00
com & bf siphon trench	cy	800	4.09	6.00
rock & bf siphon trench	cy	7,300	5.18	6.00
Embankments, compact	cy	23,400	0.60	1.00
Backfill; about structures	cy	1,700	2.92	2.50
compacting	cy	1,270	4.38	5.50
Riprap	cy	6,830	4.70	4.00
Sand & grav bed for riprap	cy	524	8.76	8.00
Trim earth fdn, conc lin 1st21M	sy	21,000	0.61	1.15
over 21 Msy	sy	10,000	0.43	1.15
Prep rck fdn, conc lin 1st19M	sy	19,000	2.56	1.15
over 19 Msy	sy	28,000	1.50	1.15
Placg compact imperv ling cnl	sy	1,500	2.19	2.00
Pipe under dr, canal 6"⌀	lf	1,000	5.84	7.50
outlet dr, canal 6"⌀	lf	280	1.75	2.50
8"⌀	lf	970	2.34	3.50
toe dr, div dam 8"⌀	lf	200	14.60	15.00
Concrete, structures	cy	420	166.00	220.00
lining trapez sect canal	cy	5,860	42.35	42.00
rectang & cut-cov sect	cy	2,280	94.00	128.00
Cement, furn & handle	bbl	12,800	7.40	7.50
Steel, reinf bars	lb	307,000	0.23	0.17
Joint filler, elast ½"	sf	4,450	2.26	2.00
Waterstops in jnts, tpH rubber	lf	6,180	1.85	2.00
Timber, structures, untreat	Mbm	3.7	380.00	400.00
treated	Mbm	0.6	380.00	600.00
CP, non-cylndr, 24" tp R jnts	lf	64	39.00	40.00
CCP, ES 30"	lf	21	25.00	30.00
48" for syphon	lf	2,783	59.00	47.00
CI slide gates, 24"⌀	ea	2	200.00	300.00
42"x30"	ea	1	570.00	700.00
Misc, metal work	lb	1,350	0.70	1.00

Completion schedule: 660 calendar days
Liquidated damages: $200 per calendar day

Homelite Now Has Full Line of Carryable Construction Equipment



Self-Priming Centrifugal Pumps . . . Carry these lightweight, dependable pumps anywhere. Non-clogging design . . . 28 foot suction lift . . . capacities up to 15,000 g.p.h. . . . sizes from 1½" to 3". Diaphragm pump also available.

Builder's Hammer . . . Gouge, drill or chisel in any type of material — faster, easier, and at lower cost — with a Bosch (Germany) Builder's Hammer. Automatic rotary impact action for drilling. Either 110 volt AC-DC or high-cycle motor. Powerful, high-cycle rock drill also available. Both tools may be powered by a Homelite carryable generator.

Carryable Gasoline Engine-Driven Generators . . . Lightweight Homelite generators can be carried and used anywhere to provide high-cycle and 115 volt power for your electric vibrators, tools and floodlights. Complete range of sizes up to 5,000 watts . . . all standard voltages.

HOMELITE
a division of Textron Inc.
PORT CHESTER, NEW YORK

Materials and Labor Prices

Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, June 20; Next July 18
- Clay Products, Lime, Plaster, Paint, Roofing: Last, June 27; Next, July 25
- Wage Rates, Building Board, Lath, Insulation: Last, June 27; Next Aug. 1
- Cement, Aggregate, Ready-Mixed Concrete, Asphalt: Last, July 4; Next, Aug. 8

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. struc-tural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	STEEL RAILS Per Net Ton Light	TRACK SUPPLIES Angle Bars	TRACK SUPPLIES Std Spikes	TRACK SUPPLIES Tie Plates	TRACK SUPPLIES Track Bolts
Birmingham Area	$5.275	$5.10	$5.425	$10.85		$110.50	$130.00	$6.975	$9.75	$6.60	.....
Chicago Area	5.275	5.10	5.425	10.85	$6.225	110.50	130.00	6.975	9.75	6.60	.....
Pittsburgh Area	5.275	5.10	5.425	10.85	6.225	110.50	130.00	6.975	9.75	6.60	$13.10
Buffalo Area	5.275	5.10	5.425	10.85	6.225	110.50	130.00	6.975	9.75	6.60	13.10
Cleveland	.....	.....	5.425	10.85	6.225	.....	.....	.....	.....	.....	13.10
Youngstown Area	.....	.....	5.425	.....	.....	.....	.....	.....	9.75	.....	.....
Geneva	5.275	5.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles	5.975	.....	6.125	.....	6.225	.....	.....	.....	9.75	6.75	.....
Pueblo	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Fairless Works, $5.575.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price 5 tons to carload lot New billet	REINFORCING BARS Rail steel	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	EXPANDED METAL LATH Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill
Atlanta	$8.44	8.90	$8.08‡	$52.00	$57.00	
Baltimore	8.67	8.10j		42.00	46.50	
Birmingham	8.20‡	8.07‡	8.07‡	66.25p	71.00p	
Boston	9.10a	8.15	8.15	47.50	51.00	
Chicago	8.77	6.91gu	6.91gu	52.00‡	63.00‡	
Cincinnati	8.89ak	8.43re		43.50mn	48.00mn	
Cleveland	8.57	6.54r		44.50‡	49.00‡	
Dallas	9.95	8.50	8.50	57.00	62.00	
Denver	9.80	8.45c		57.00n	63.00n	
Detroit	8.74	8.13		56.00	63.00	
Kansas City	8.87a	7.65		48.00	52.50	
Los Angeles	9.60fd	7.35		58.50	64.50	
Minneapolis	8.64d	8.91b	8.91b	41.50	46.00	
Montreal	8.25-9.00aC/8.30-8.70A	7.75/9.95t	7.75/9.95t	65.70A	70.20A	
New Orleans		7.70gks		45.50	50.00	
New York	8.91s	7.80dy	7.80dy	50.50n	57.00no	
Philadelphia	8.04	7.14		42.50‡	47.00‡	
Pittsburgh	7.43	6.57		42.50	47.00	
St. Louis	8.67s	8.05c	8.05c	60.60l	62.00l	
San Francisco	9.15	9.10j		47.50	53.00	
Seattle	9.35d	8.60e		62.00nr	68.00nr	
Toronto	8.75*	7.60	7.60	59.50nq	62.75nq	

EXTRAS, per cwt: ◆Quantity (applies to L.C.L. shipments only): under 1,000, +$1.40; 1000-1999, +$1.20; 2000-4999, +90c; 5000-9999, +60c; 10,000-19,999, +40c; 20,000-29,999, +30c; 30,000-39,999, +10c; 40,000 & up, none. ◆Size: 7 to 9 in., +$2.50; 3 to 6 in., +$1.40; 1 to 2½ in., +$1.00; 5- to 7-in., 6- to 7-in., +$2.20; over 9 in., +$4. ◆Bending: brass, +60c; light gauge, +50c. ◆Engineering details and planting from designs by others: over 500 tons, +45c; 200-499 tons, +50c but not over $1500; 25-199 tons, +65c but not over $750; 5-19 tons, +85c but not over $300; under 5 tons, +$1.00 but not over $85. Min. charge $25. Design only: +60c

Quantity extras, per cwt: under 100, +$9; 100-399, +$6; 400-999, +3.50; 1000-1999, +1.00; 2000-4999, base price; 5000-9999, —10c; 10,000-19,999, —30c; 20,000-29,9999, —50c; 30,000 and up, —70c

WELDED FABRIC REINFORCING Per 100 sq ft., carload lots fob mill

- 4 × 16 in., No. 5 & 10 wire—Joliet, Ill., Donora, Pa., Monessen, Pa.: $3.78
- 4 × 12 in., No. 8 & 12 wire—Joliet, Ill., Donora, Pa., Monessen, Pa.: $2.50
- 8 × 8 in., No. 6 & 6 wire—Joliet, Ill., Donora, Pa., Monessen, Pa.: $3.95

*‡ Delivered. *= Aver. of Canadian & American. *a 2000-9999#. *b 10,000-15,999#, fob city. *c 20 tons or over. *d 10,000-19,999#. *e Intermediate struct'l. *f Incl. delivering in free zone. *g CL. *h list price; dominion tax exempt; add provincial and municipal taxes. *i add dominion, provincial and municipal sales taxes. *j intermediate and hard grade. *k fob city. *l delivered; contractor to do unloading. *m copper alloy. *n LCL. *o asphalt coated. *p del. of 500 sq. yd. or more. *q 3 lb. *r 2% off for cash. *s 2,000-4,999#. *t add 15¢ del. *u add 6.25¢ switch. *v incl 15¢ del. *x add 5¢ switch. *y add 35¢ del. *z add 10¢ del. *A American made. *C Canadian made. *D ½% for cash.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE PRICE INDEXa	ASBESTOS CEMENT PIPE per lin. ft. f.o.b. city 6" Pr Cl. 150	ASBESTOS CEMENT PIPE 12" Sew Cl. I	CLAY SEWER PIPE Per ft., delivered ASTM C13-55 24 in. 8 in.	CLAY SEWER PIPE ASTM C13-55 36 in. 12 in.	CLAY SEWER PIPE ASTM C200-55T 6 in. 24 in.	CLAY SEWER PIPE ASTM C200-55T 8 in. 36 in.	CLAY DRAIN TILE‡ Per 1,000 ft., load lots, f.o.b. ASTM C4-55 6 in.	CLAY DRAIN TILE‡ 8 in.	CONCRETE SEWER PIPE Per ft., delivered§ ASTMC 14-55 12 in.	CONCRETE SEWER PIPE 24 in.
Atlanta	123.7	$1.64	$2.68	$.58	$1.00	$4.40	$14.50	$277.00s		$1.55m	$4.40m
Baltimore	133.3	1.64	2.46	.665	1.28	5.08u	12.71	187.80	$289.20	1.01	2.75m
Birmingham	119.0	1.64	2.68	.46	.86	3.70uv	10.37uv	260.00‡	440.00‡	1.25m	2.75
Boston	136.2	1.66	2.46	.812qrt	1.566qrt	6.525qrt		215.40r	330.60r	1.56mg	3.47mg
Chicago	134.1	1.64	2.46	.93m	1.78m	7.52m	21.16m	220.00m	330.00m	1.30	4.00
Cincinnati	128.7	1.66	2.55	.665t	1.282St	4.905t	12.505	240.00	370.00	.85m	3.25m
Cleveland	134.9	1.66	2.55	.595s	1.1475s	4.725t	12.4025t	155.40m	240.60m	.85m	3.50m
Dallas	131.0	1.66	2.80	.439	.799	4.006	9.176			.63	1.86
Denver	141.4	1.73	2.80	.47n	.84n	3.73n				.75m	2.75m
Detroit	135.3	1.66	2.55	.90	1.70	6.80	18.50	240.00m	370.00m	1.10	3.82
Kansas City	131.7	1.66	2.55	.61	1.105	5.518	14.95	275.00	485.00	.90	2.90
Los Angeles	141.8	1.73	2.46	.74f	1.61f	6.42f	15.36f	360.00f	530.00f	1.12	3.32f
Minneapolis	143.1	1.68	2.68	.86mo	1.55mo	6.70mo		288.00	545.00	1.76A	4.74A
Montreal				1.07u	1.90u	6.80u	12.50u			1.17A	3.11y
New Orleans	126.5	1.64	2.68	.528	.983	5.10		210.50yz	528.00	.85	2.90
New York	131.7	1.66	2.46	1.02	1.94	7.56	19.48			1.50	3.00
Philadelphia	131.0	1.64	2.46	.65	1.25	4.95x	12.65x	300.00‡	350.00‡	1.60A	3.95A
Pittsburgh	136.1	1.66	2.46	.468m	.864m	3.86m	9.78m	152.00	244.00	1.05A	2.50A
St. Louis	130.1	1.64	2.55	.50	1.08	4.45	10.80	180.00l	380.00l	1.45il	3.10il
San Francisco	141.8	1.73	2.46	.78d	1.69d	6.72d	16.36d	320.00l	560.00l	1.05m	3.30m
Seattle	142.2	1.73	2.46	.67b	1.33b	6.84		220.00e		1.10k	3.25k
Toronto				.76	1.425	6.00		157.00	280.00	1.02	3.57

*‡ Extra quality. *½ extra strength. *‡ delivered. *a PRICE INDEXES for CENTRIFUGAL CAST IRON PIPE (Include carload freight allowed to city). These also serve as the HISTORICAL RECORD of THE $ PER NET TON PRICE of CLASS B, B&S, PIT CAST IRON PIPE. F.O.B. Foundry Price Indexes Birmingham, Ala., 119.0; Burlington, N. J., 127.8. *b Extra strength. *c 4-in., $130. *d SS361-A. *e 30-in. *f 21 in. *g culvert pipe; reinforced, ASTM C 75-56. *h reinforced, ASTM C 75-54. *i reinforced, ASTM C 76-54. *j centrispun; no standard specs. in Canada. *k 2% off for cash. *l fob plant. *m truck delivery. *n LCL delivered, fob truck. *o listed price based on LCL (no min.). *p freight allowed to destination in city. *q ASTM C 13-40. *r CL fob origin, freight allowed. *s 2 ft lengths. *t 3 ft lengths. *u CESA A 60-1941 specs. used. *v standard strength. *w SS; add 20% for d.s.

***WROUGHT STEEL PIPE—(Full standard weight) Discount from list; see footnote**

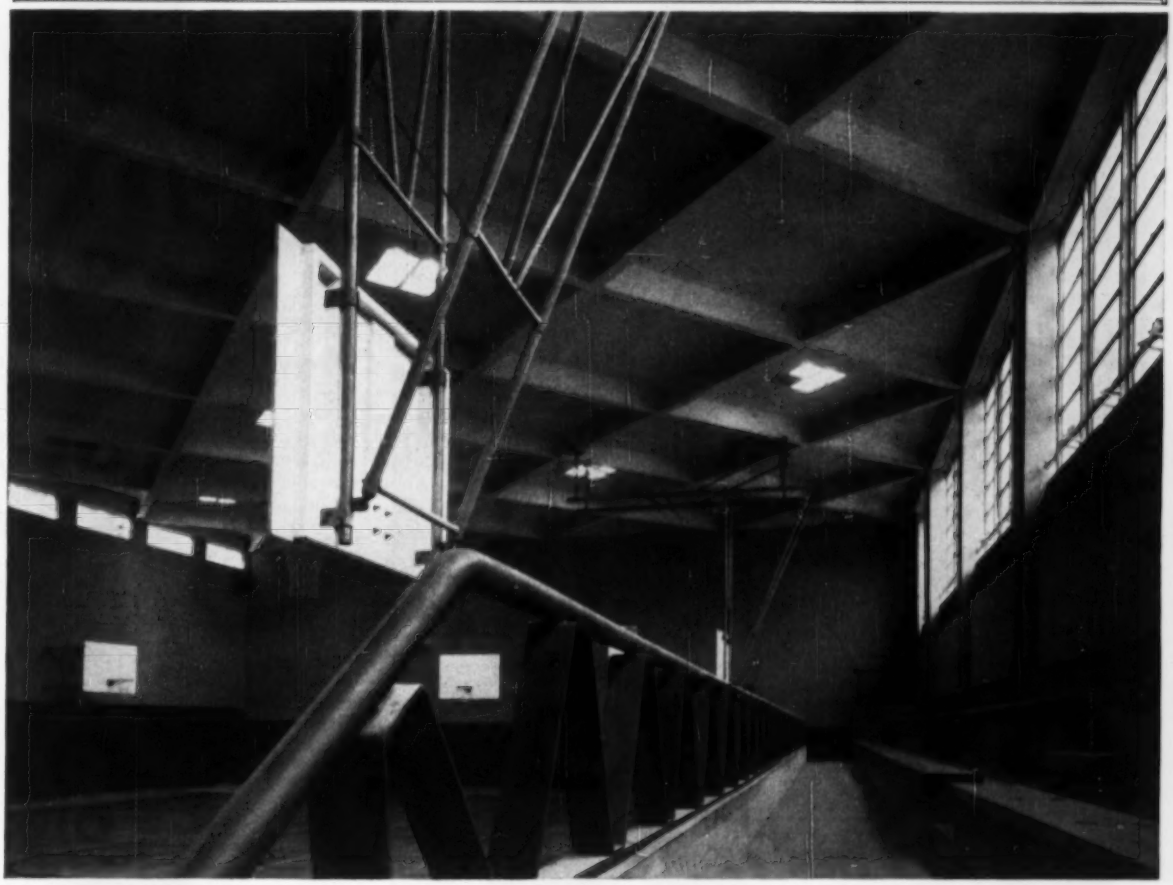
	Mill	3½ to 6 in. Lap Weld+ Black %	3½ to 6 in. Lap Weld+ Galv. %	2½ & 3 in. Butt Weld+ Black %	2½ & 3 in. Butt Weld+ Galv. %
Atlanta	Lorain, Ohio	10 25e	+4 00a	20 7.5	4 50
Baltimore	Aliquippa, Pa	4 25e	+12 50	20 7.5	4 50
Birmingham	Sparrows Pt., Md.			18 7.5	2 50
Boston	Beaver Falls, Pa	13 50z	+0 75a	20 7.5	4 50
Chicago	Youngstown, O	10 25	+6 50a	20 7.5	4 50
Cincinnati	Indiana Harbor, Ind.	9 25ab	+7 50a	19 7.5	3 50
Cleveland	Lorain, Ohio	10 25e	+7 50z	20 7.5	4 50
Dallas	Alquippa, Pa	8 50d	+5 75d	20 7.5	4 00
Denver	Sparrows Pt., Md.	+2 75ab	+21 50ab	20 7.5	+10 50
Detroit	Beaver Falls, Pa	+7 50z		20 7.5	4 50
Kansas City	Youngstown, O	+7 50z		20 7.5	4 50
Los Angeles	Indiana Harbor, Ind.	+7 50z		19 7.5	3 50
Minneapolis	Sharon, Pa.	+7 50z		20 7.5	4 50
Montreal	Wheatland, Pa	+5 75d		20 7.5	4 00
New Orleans	Etna, Pa	+5 75d		20 7.5	4 00
New York	Fontana, Calif.	+21 50ab		7 7.5	+10 50
Philadelphia	Beaver Falls, Pa	+7 50z		20 7.5	4 50
Pittsburgh	Youngstown, O	+7 50z		20 7.5	4 50
St. Louis	Indiana Harbor, Ind.	+7 50z		19 7.5	3 50
San Francisco	Sharon, Pa.	+7 50z		20 7.5	4 50
Seattle	Wheatland, Pa	+7 50z		20 7.5	4 00
Toronto	Etna, Pa	+5 75d		20 7.5	4 00

a 3½ to 4 in. b Continuous +Threaded and coupled. weld. e 5 and 6 in. d 6 in.

*** WROUGHT STEEL PIPE:** Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft.(*based on approx. $200 per net ton): Butt Weld ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 78½¢. Lap Weld 3½ in., 92¢; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight, 3% transport tax for destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: Butt Weld—1 in. black, + 65.54, galv., + 95.77; 1¼ in. black, + 65.54, galv. + 95.23, 1½ in. black, + 61.79 galv. + 91.22; Lap Weld—2½ in. to 3 in. black + 67.95 galv. + 95 77; 4½ in. to 8 in. black + 64.74 galv. + 90.68 Add freight rates plus 3% transportation tax to get destination price.

ON THE NEWS FRONT WITH STRUCTURAL STEEL



Architect: Appleton and Wolfard; *steel fabricator:* Golden Gate Iron Works, Inc.; *consulting engineer:* Ira S. Kessey; all of San Francisco.

Architect: John C. Hoops, San Francisco; *steel fabricator:* Schrader Iron Works; *civil engineer:* John Brown, San Francisco.

Exposed Steelwork in Building

Two recent examples of how steelwork in buildings is left exposed for its beauty are shown here. At the top is the Eureka Valley Recreation Center gymnasium in San Francisco. Here structural steel spans the 70 by 107 ft room in a bold grid pattern made up of interlacing diagonal Bethlehem 18 in. wide-flange beams.

Below is a house in Sausalito, Calif., which has an exposed structural steel framework. Noteworthy in the construction of this house is the use of a steep-sloping site. Bethlehem structural shapes were used as supporting columns as well as for the framework.

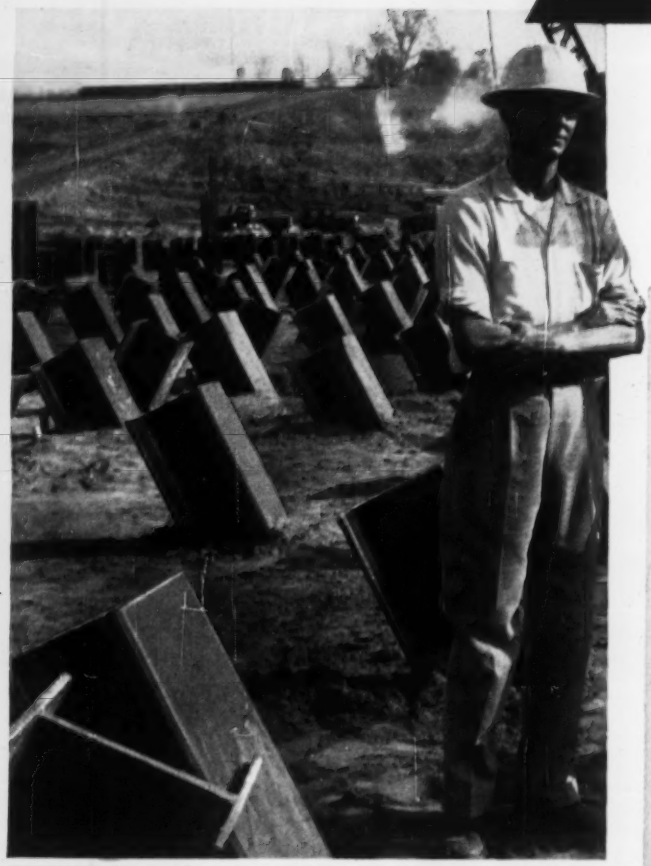
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

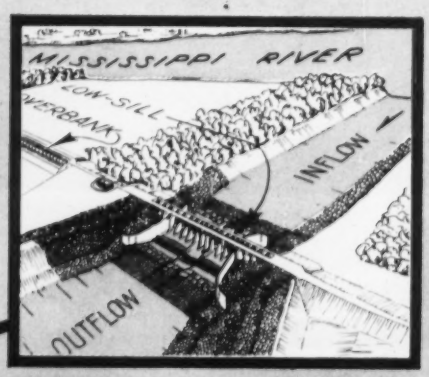
On vast OLD RIVER

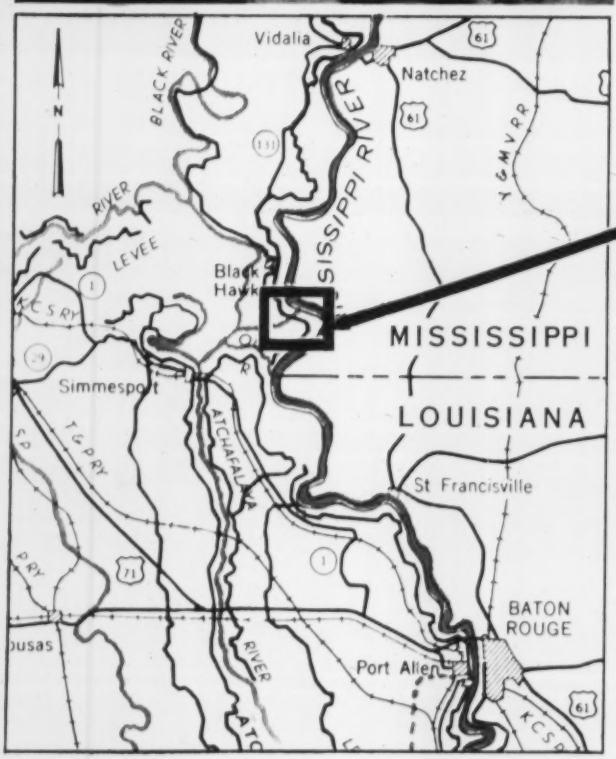
"Driving USS for foundation

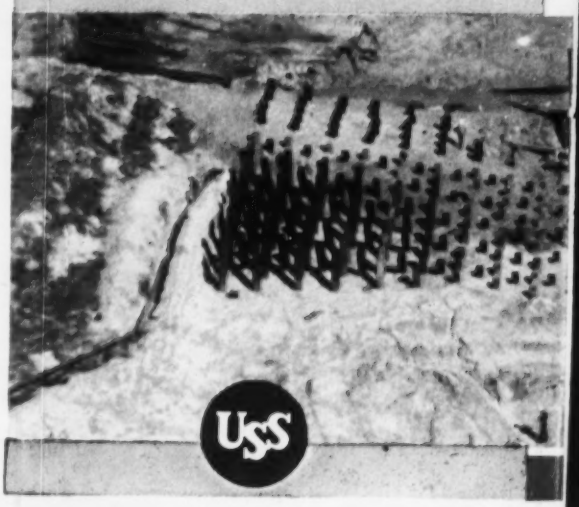


THE PROJECT AND PRINCIPAL FEATURES

Designed by the Mississippi River Commission, Corps of Engineers, U. S. Army, to prevent the Atchafalaya River from capturing the Mississippi River through diversion waters into the Old River, this $75,000,000 project will require from eight to ten years to complete. Located in Concordia Parish, Louisiana, the Old River Control plan has three principal features: two control structures on the west bank of the Mississippi about ten miles upstream from Old River Junction, a navigation lock connecting the two rivers, and the low sill structure, the foundation of which is now under construction.







CONTROL project in Louisiana . . .

STEEL H-BEAM BEARING PILES of 977-ft. LOW SILL STRUCTURE,

We're Well Ahead of Schedule!"

THE INITIAL PHASE of the $75,000,000 Old River Control project, involving the construction of the 977-ft. Low Sill Structure, is proceeding at a fast pace.

Mr. Frank Mitchell, Construction Superintendent for the contractor, F & C Engineering Company, Inc., of Houston, Texas, says that as of January 15—barely five months after driving began—827 of the approximately 1920 USS H-Beam Bearing Piles for the foundation had been driven to put his men "Well ahead of schedule."

Approximately 44,000 lineal feet of vertically driven steel piles and 155,000 lineal feet of piles driven on a batter will be required to support the huge structure. The minimum length of the vertical piles is 82′ and their maximum length is 115′. The batter piles range from 79′ to 131′ in length.

In addition to the bearing piles for the foundation, approximately 550 tons of USS Steel Sheet Piling were driven to provide three 700-ft. cut-off walls.

If you would like to have more detailed information on the application of these dependable USS Engineering Products, write for our fact-filled Bearing Pile and Sheet Piling catalogs.

UNITED STATES STEEL CORPORATION, PITTSBURGH, PA. · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
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100-Page Book on Steel Bearing Piles

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UNITED STATES STEEL

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, M. E. SCIORRA, D. TARTAGLIA, S. N. NOLAN, Reports
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—LB & CA

Jefferson Constr. Co., 75 1st St., Cambridge, Mass., LB $723,349, est. $768,900, 2 bldgs., bachelor officer quarters, Westover Air Force Base, ENG-19-016-57-236, CHICOPEE, MASS. U. S. Eng., 150 Causeway St., Boston, Mass. Hoyle, Doran & Berry, 248 Boylston St., Boston, Mass., archts. Bids 6/18. CD 1/25.

Anderson-Fairoaks Constr. Co., 227 Newfield Ave., Hartford, Conn., LB $323,000 (3 bidders) Proj. SF-D-192, skating rink, University of Connecticut, STORRS, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids June 26. CD 6/11.

BUILDINGS—LB & CA

▲ **A. W. Vappi & Co., Inc.**, 240 Sidney St., Cambridge, Mass., LB $2,000,000, FACTORY addn., Neponset Ave., FOXBORO, MASS. The Foxboro Co., Neponset Ave., Foxboro, Mass. Bids June 14. CD 6/3.

▲ **G. L. Rugo & Sons, Inc.**, 80 Boylston St., Boston, Mass., LB $1,273,372, HOSPITAL addn., alterations, METHUEN, MASS. Bon Secours Hospital, c/o Chancery Office, 1 Lake St., Brighton, Mass. Bids June 26. CD 6/7.

▲ **Donatelli Bldg. Co.**, 118 Cottage Ave., North Providence, R. I., LB $1,034,613 (base bid), est. $1,207,000, HIGH SCHOOL, Child St., WARREN, R. I. Town, School Comm., Warren, R. I. Bids June 24. CD 6/10.

▲ **Brooklawn Constr. Co.**, 254 Prospect Ave., Hartford, Conn., CA $1,071,000. moderate rental HOUSING, Proj. MR-63, WINSTED, CONN. Town Housing Auth., Town Hall, Winsted, Conn. Bids Apr. 30. CD 5/10, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† **New York**—BA 7/16—U. S. Eng., 111 E. 16 St., New York, Zone 3, channel rehabilitation at Tioughnioga River Lisle, CIVENG-30-075-57-87. Extended date. CD 6/21.

† **N. Y., Westhampton**—TEST CELL—BA On Or About 7/25—U. S. Eng., 111 E. 16 St., New York, Zone 3, test cell, jet Suffolk County Air Force Base, ENG-30-075-57-557, $200,000-$250,000. CD 8/22.

† **New York**—ATHLETIC FACILITIES—BA On Or About 8/8—U. S. Eng., 111 E. 16 St., Zone 3, N. Y. athletic facilities, at AAA facilities, New York and Niagara Areas, $100,000-$500,000. James P. O'Donnell, 39 Broadway, New York, Zone 6, archt. CD 4/29.

BUILDINGS—BA

▲† **N. Y., Fort Jay**—HOUSING—BA On Or About 7/16—U. S. Eng., 111 E. 16 St., New York, Zone 3, 238 units of Capehart Housing, $1,000,000-$3,000,000. Kell & Gruzen, 80 Fifth Ave., New York, Zone 3, archts. CD 12/5/56; under Commercial Buildings.

▲† **N. J., Fort Monmouth**—HOUSING—BA On Or About 7/18—U. S. Eng., 111 E. 16 St., New York 3, N. Y. $1,000,000-$3,000,000. S. J. Kessler, 551 Fifth Ave., New York 17, N. Y., archts. CD 4/29.

Pa., **Trappe**—SCHOOL—BA 7/19—Collegeville-Trappe Joint School Auth., Trappe Elementary School, $500,000. John S. Carver, 2112 Spruce St., Phila., archt. Robert McLaughlin, 1411 Walnut St., Phila., engr. CD 1/4.

▲ **N. Y., Fort Wadsworth**—HOUSING—BA On Or About 7/25—U. S. Eng., 111 E. 16 St., New York, Zone 3, 120-unit Capehart Housing. $1,000,000-$3,000,000. Samuel Paul, 80-51 164 St., Jamaica, archt. CD 12/5, under Commercial Buildings.

† **N. Y., Fort Tilden**—HOUSING—BA On Or About 8/8—U. S. Eng., 111 E. 16 St., New York 3, N. Y., 50 unit Capehart housing. $500,000-$1,000,000. Emil Schmidlin, 586 Central Ave., East Orange, archt. CD 12/7.

† **N. Y., Fort Tilden**—HOUSING—BA On Or About 8/8—U. S. Eng., 111 E. 16 St., New York, Zone 3, 48-unit Capehart Housing, $500,000-$1,000,000. H. Kamenka, 101 Park Ave., New York, Zone 17, archt. CD 12/28/56, under Commercial Buildings.

† **N. Y., Fort Totten**—HOUSING—BA On Or About 8/13—U. S. Eng., 111 E. 16 St., New York, Zone 3, 72-unit Capehart Housing. $500,000-$1,000,000. Morris B. Adler, 16 Court St., Brooklyn, Zone 2, archt. CD 12/6, under Commercial Buildings.

BUILDINGS—SLC

▲ **Pa., Allentown**—SHOPPING CENTER—Food Fair Properties, Inc., 99 Park Ave., New York, N. Y., soon lets contract, Unit No. 3 shopping center addn. $1,000,000. George W. Neff, 1520 Locust St., Phila., archt.

HEAVY CONSTRUCTION—LB & CA

Mal. Bros. Constr. Co., 38 Highland Ave., Newark, N. J., LB $318,375, paving and furnishing, installing utilities for Tyler St., Contr. PN-430.011, PORT NEWARK, N. J. Port of New York Auth., 111 8 Ave., New York 11, N. Y. Bids June 25. CD 6/6.

Herbert R. Imbt, Inc., State College, Pa., LB $140,889. recreational area at George B. Stevenson Dam at Sinnemahoning, Cameron Co., PENNSYLVANIA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids June 26. CD 6/7.

† **Contracting Officer, Dpt. Army & Air Force, National Guard Bureau**, U. S. Property & Fiscal Office for Pennsylvania, R.D. No. 2, Annville, Pa., cancelled bids to have been opened May 28, administration bldg addn. for utilization as food service kitchen, Greater Pittsburgh Airport, CORAOPOLIS, PA. CD 5/2.

V. Nenna & J. D'Amiano, 254 Long Ave., Hillside, N. J., LB $996,299. sewerage sys., HELLERTOWN, PA. Hellertown Borough Auth., Boro Council Chambers, Boro Hall, 685 Main St., Hellertown, Pa. Bids May 27. CD 4/10.

▲† **Ritter Brothers**, 1511 N. Cameron St., Harrisburg, Pa., CA $5,896,276. Special AMC Warehouses, supporting facilities, Olmstead Air Force Base, ENG-18-020-57-32, MIDDLETOWN, PA. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. Bids May 8. CD 5/10, under LB.

† **N. I. Lewis Constr. Co.**, 45 E. Main St., Middletown, Pa., LB $793,504 (5 bidders) D.M. general purpose SHOP conversion, Olmstead Air Force Base, ENG-18-020-57-41, MIDDLETOWN, PA. U. S. Eng., 23 St. and Maryland Ave., Baltimore 18, Md. Bids June 6. The Kuljian Corp., 1200 N. Broad St., Phila. 21, Pa., engrs.-archts. CD 5/23.

M. & M. B. McHugh, 892 N. Markoe St., Phila., Pa., LB $107,813, Bid 2833, water mains at various locations, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids June 18. CD 6/10.

D. & C. Spinosa, 2 N. Jerome St., Allentown, Pa., LB $90,747, Bid 2834, sanitary sewers, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Samuel S. Baxter, c/o owner, water comr. CD 2/4/44.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England	**Middle West**
Middle Atlantic	**West of Mississippi**
South	**Far West**

PROPOSED WORK

Water Supply	**Public Buildings**
Sewers, Waste Disposal	**Mass Housing**
Bridges	**Commercial Buildings**
Streets & Roads	**Industrial Buildings**
Earthwork, Waterways	**Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
SOON LETS CONTRACT: SLC
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.
CD dates shown are of Construction Daily Issue in which last previous report was published.
OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

James D. Morrissey, Inc., 9119 Frankford Ave., Phila., Pa., LB $138,843, Bid 6580, Taxiway R-4, Runway 6-24, resurf. North Philadelphia Airport, PHILA., PA. Dpt. Procurement, City Hall Annex, Phila., Pa. Bids June 17. CD 6/3.

▲ **MARYLAND**—State Rd. Comn., 108 E. Lexington St., Baltimore, Zone 2, Bids opened 5/14,
J. O. and C. M. Stuart, Inc., 3121 South St. N.W., Wash., D. C., CA $2,177,373, surf. 838 mi. dual hy. Washington National Pike, constr. two 3 span steel beam bridges and one 3 span plate girder bridge, Contr. M 485-22-23:33-320, ENG-18-020-57-32, Montgomery Co. CD 5/16, under LB.

Princemont Constr. Corp., 322 N. Stone St., Rockville, Md., CA $587,911, paving, repaving and widening roadway of Bladensburg Rd. N.E. between 24th Place and Eastern Ave. (Fed. Aid Proj. F-65(2), WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids June 7. CD 6/17, under LB.

Myers & Quigg, 91 "O" St. S.E., Wash. 3, D. C., LB $76,805, imprv. various roadways with c. conc. pavements; LB $98,333, fall comb. cover and replacement, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids June 21

Donaldson Paving Co., Inc., 20 Potomac Ave. S.W., Wash., D. C. LB $156,761 (4 bidders) concrete curb and gutter and laying b. conc. surf., WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids June 24. CD 6/20.

Myers & Quigg, Inc., 91 "O" St. S.E., Wash., D. C., LB $261,396 (5 bidders) repairing c. conc. roadway, alley pavements and sidewalks at various locations, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids June 25. CD 6/20.

Whiting Turner Contg. Co., 305 Natl. Marine Bank Bldg., Baltimore 2, Md., LB $133,694 (3 bidders) rehabilitation of 11 St. Bridge over Anacostia River, WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids June 19. CD 6/12.

BUILDINGS—LB & CA

Benderson Development Co., 123 Franklin St., Buffalo, N. Y., LB $300,000. 1 story FACTORY and OFFICE, 1722 Walden Ave., BUFFALO, N. Y. Wheeling Corrugating Co., Ohio and Ganson Sts., Buffalo, N. Y.

Mar-Mes Constr. Co., 271 North Ave., New Rochelle, N. Y., CA $808,158. RESIDENCE HALL and CHAPEL, NEW ROCHELLE, N. Y. Iona College, 751 North Ave., New Rochelle, N. Y. Bids June 18. CD 6/12.

† **Wright & Kremers**, Pine and Main Sts., Niagara Falls, N. Y., LB $465,496 (4 bidders) ARMY RESERVE TRAINING CENTER, ENG-30-075-57-403, TONAWANDA, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids June 26. CD 6/4.

▲ **Brown & Matthews, Inc.**, 404 Fourth Ave., New York, N. Y., CA Est. $1,000,000, 1 story, 120,000 sq. ft. brick WAREHOUSE AND OFFICE, DENVILLE, N. J. Radio Corporation of America, 30 Rockefeller Plaza, New York, N. Y.

▲ **John Rocco**, 163 Hancox Ave., Nutley, N. J., Own Forces. $1,200,000, 75 HOUSES, Old Mine Hill Rd., known as Indian Park Estates, HACKETTSTOWN, N. J. James Centanni, 263 Clinton Ave., Newark, N. J., archt.

Benjamin Yedlin, 123 Mason Dr., Metuchen, N. J., Own Forces, $800,000, 32 HOUSES, Washington Valley Rd., MARTINSVILLE N. J., George Boylan, River Rd., Rt. 24, New Brunswick, N. J., archt.

Nason & Cullen, Inc., 6522 Vine St., Phila., Pa., CA $568,800, CLUB HOUSE, parking area, CHESTER, PA. Sun Oil Co., 1608 Walnut St., Phila., Pa. CD 4/10.

† **William Linker Co.**, 2036 Arch St., Phila., Pa., LB $367,400, general contract TRAINING CENTER GARAGE and related site imprvs., CHESTER, PA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Roth & Fleisher, 1612 Market St., Phila., Pa., engrs.

C. R. Lange, 52 E. Lancaster Ave., Ardmore, Pa., Separate Contracts, $350,000. RESIDENTIAL DEVELOPMENT, Page Terrace, etc., GLADWYNNE, PA. Erling H. Wenge, McCatchy Bldg., Upper Darby, Pa., archt.

Leonard Shaffer Co. & Arthur A. Kober Co., 207 S. 24th St., Phila., Pa., CA $350,000 (joint project) CLUB HOUSE addns., alterations, Philmont, HUNTINGDON VALLEY, PA. Philmont Country Club, Huntingdon Valley, Pa. Abraham Levy, 1411 Walnut St., Phila., Pa., archt. Bloom & Dorfman, 1411 Walnut St., Phila., Pa., engr.

▲ **Presbyterian Hospital**, 51 N. 39 St., Phila., Pa., cancelled bids to have been opened May 28, 6 story, brick, steel HOSPITAL addn., PHILA, PA., Est. $1,500,000. CD 5/15.

Mariani Constr. Co., 6918 Bustleton Ave., Phila., Pa., Separate Contracts. $350,000. RESIDENTIAL DEVELOPMENT, Draper and Culfax Sts., PHILA., PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Conway & Ryan, Inc., 2313 Fairmount Ave., Phila., Pa., LB $253,214, Southeast SERVICE BLDG., 7th St. and Pattison Ave., Bids 4985-4989; PHILA., PA. Dpt. Procurement, City Hall, Annex, Phila., Pa., George F. Lovatt, Jr., City Hall, Phila., Pa., city archt.

Harold E. Irwin, 1200 Dyre St., Phila., Pa., CA $200,000. 1 story, 25,000 sq. ft., masonry, concrete block,

(Continued on page 112)

AUSTIN-WESTERN HYDRAULIC CRANE

cuts costs on city and suburban pipeline jobs for UNITED PIPE LINES, Beloit, Wis. *reports Gene Alters, president*

Mr. Alters says: "The results other contractors were reporting in the use of the Austin-Western hydraulic cranes caused us to rent one of these units long enough to prove that we could get the same increased speed in laying pipelines under city and suburban conditions, instead of using conventional side boom equipment. It did not take us long to prove on our own work in difficult locations, especially in or near towns, that with pipe as large as 12 in. there is no comparison between the greater mobility, speed and time saving with this unit over older methods. . . . In July 1956, therefore, we bought our first A-W unit."

Second unit bought, third rented. "A few months later we added a second unit. During the busy season last fall we rented a third unit for five months from August through December, as they continued to prove themselves decidedly more profitable in laying pipe."

Developed special tools. "We developed special calipers or pipe hooks to handle long lengths of pipe and take every advantage of the precision of hydraulic controls on these cranes. The live boom raises and lowers while it rotates in a full 360° circle. . . . We developed and welded on one of the units a 'bending shoe' at the front bumpers. With chains at either end this powerful hydraulic crane lifted up the ends of a 40 ft. 8 in. pipe and bent it the way we wanted it."

Lays a mile of pipe in 10 hours. "A hurry-up job in Fort Atkinson called for laying 1 mile of 8 in. gas pipe down a trench beside a city street. We put several crews on the different operations and our two Austin-Western cranes unloaded, strung out and handled the welding operations complete in 10 hours on a Saturday, with minimum inconvenience to traffic and great satisfaction to the city authorities."

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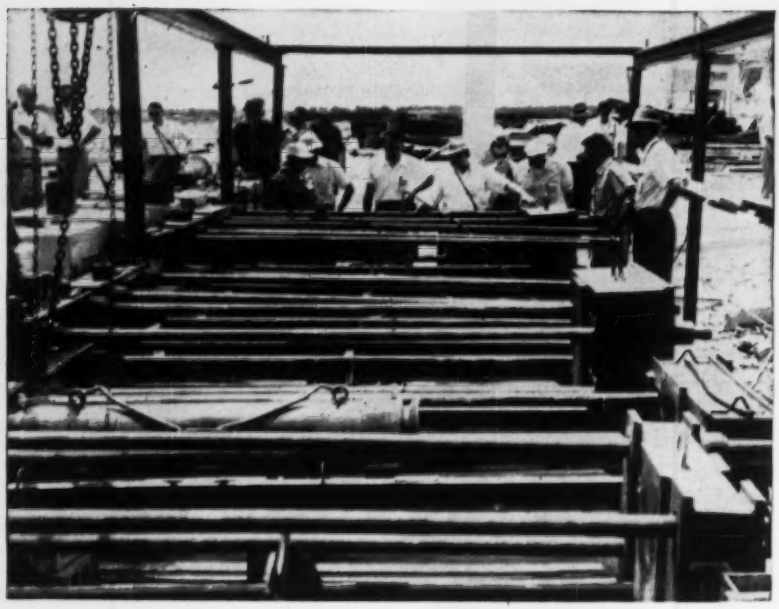
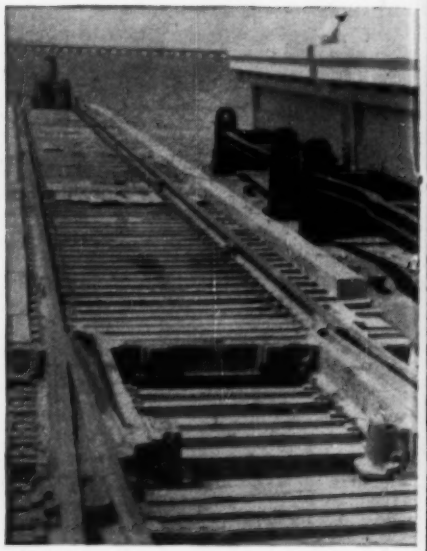
This Amazing Prestressed Concrete Industry





What Is Behind Its Phenomenal Growth?

This is a question which has been asked many times. Union Wire Rope Corporation has answered with the sound reasons for venturing a huge capital investment in expanded facilities and in research to master the technical know-how of producing prestressed, stress relieved, high tensile wire and strand. Without this key element prestressed concrete would still not be possible and practical.

To check our own reasons and to develop all of the fundamental facts responsible for the spreading use and acceptance of prestressed concrete,

We Asked A PANEL OF PIONEERS In the Prefabrication of Prestressed Concrete Members To Summarize the Facts Which Has Enabled Them To Maintain a Yearly Growth of 200 to 300 Percent.

What follows is straight from the horse's mouth. It is a summary of the fundamental facts contributed by a sizeable group of prestressed fabricators and consultants. All are pioneers who have had a part in the development of prestressed concrete and experienced its growth from a trickle five years ago to become the building material to be reckoned with by every factor in the building industry.

Here Is a List of Prestressed Products Which A PANEL OF PIONEERS Are Prefabricating

Girders

Roof Slabs
Regular, Lightweight, Lift, Channel, Thin shell, Hollow centers, Composite.

Beams
Joists
Trusses
Columns

Piles and Caps
Foundation, Marine, Fender

Lintels
Wall Panels
Siding
Posts

Pavements
Highway, Airport

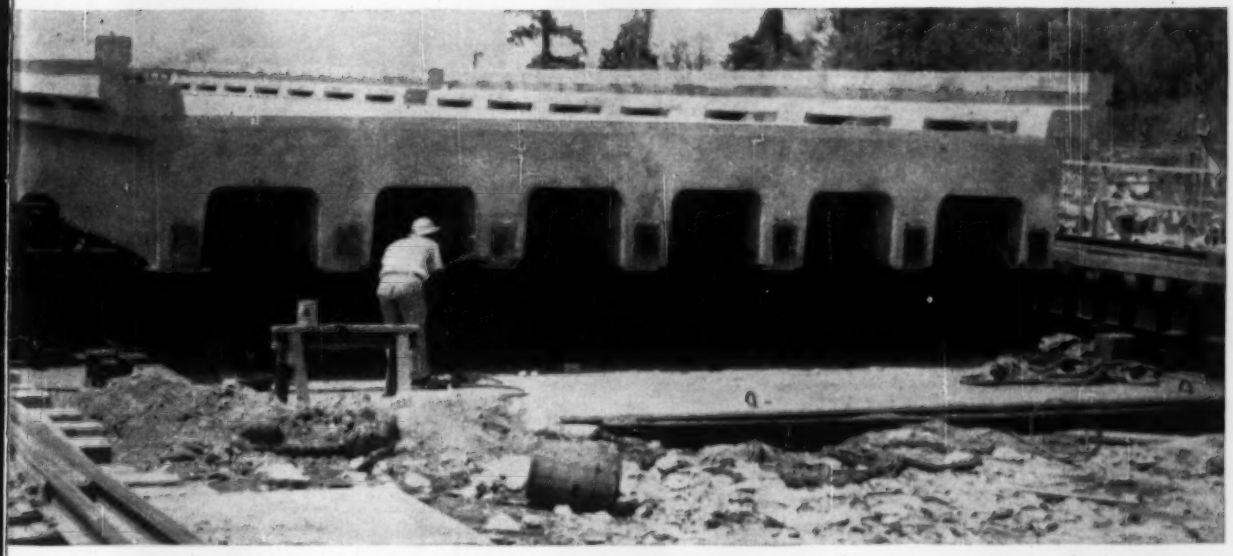
Stadium
Framing, Seats

"Future Applications of Prestressed Concrete Beyond Prediction"

These are the words of one and the consensus of opinion of others on our panel of pioneers. Other prestressed concrete products mentioned as either being prefabricated or tested and proposed are:

- Missile Wings
- Barges
- Transmission Line Supports
- Piers
- Seawalls
- Wharfs
- Arches
- Skews
- Spring Board—For Swimming Pools
- Off-shore Drilling Piles Platforms

While some of these may seem novel, many will become commonplace. Prestressing concrete for barges, for example, could very well become an industry in itself as is the prefabricating of bridge members.



PANEL OF PIONEER Prefabricators Cite These Outstanding Prestressed Concrete Advantages...

1. Fully Utilizes Two Inherent Strength Factors

Prestressing combines and enhances the inherent characteristics of two of the foremost construction materials—

A. The compression strength of concrete with
B. The high tensile strength of stress relieved cold drawn steel wire and strand.

2. Basic Economy

A. Steel for prestressing is six times stronger than ordinary steel but only approximately 3 times more costly.
B. Concrete for prestressing is twice as strong but only 10 to 20% more costly than ordinary concrete.
C. Prestressing consumes less steel and concrete to attain equal or greater structural strength more economically.

3. Structural Balance

A. In prestressed concrete, stresses and strains are balanced to produce structures whose deflections are under definite control.
B. Cracks, otherwise unavoidable in concrete, are eliminated by prestressing.

4. Design Economy

A. Prestressed concrete makes possible thinner sections, lower depth to span ratios, longer cantilevering without ballast beams and reduction in weight. All of these factors enable the designer to effect savings in foundation, in columns, in wall height or to convert head room into usable cubage.
B. Steady progress in standardization of sections under the auspices of the Prestressed Concrete Institute is making prestressed concrete more and more versatile from the standpoint of designers.

5. Prestressing Is Pre-Testing

A. Because they are subjected to greater loads in fabrication than is imposed upon them in the field, precast, prestressed members are in reality pretested.
B. Produced by factory methods, under closely controlled conditions, prestressed concrete guarantees the designer structural performance to meet or better expectations and affords relief from extensive supervision and inspections.

6. Stock Pile Availability

A. Factory line production methods with time saving devices insures delivery of prestressed concrete members from the production line in step with contractors work schedules.
B. Production of prestressed sections proceeds at top speed, affording maximum utilization of labor and stockpiling against projected construction.
C. Prestressed concrete eliminates construction delays by by-passing materials in short supply or on extended backlog delivery.

7. Speeds Up Construction

A. Construction by the older, conventional methods involves both erection and fabrication on the job site.
B. The latter is accomplished much faster in central plants or on the site mechanized plants and the resulting prefabricated units are erected with clocklike precision.
C. Often it is possible to complete structures in half the time required by conventional methods. It is often possible to erect prestressed concrete in the time required to make, place and shore up forms for poured in place concrete.

8. Permanence of Concrete—Plus

A. Well known is the durability of concrete. Well known too is its vulnerability to cracking. Cracks lay it and its reinforcing open to deterioration.
B. Prestressing makes concrete a flexible material with the ability to withstand extraordinary deflection and recover without cracking.

9. Insurance Savings

Comparison of insurance premiums are reported on new buildings with prestressed concrete roofs as against old buildings with wood roofs. Roughly the yearly premium on the latter is more than for 5 years on buildings with prestressed roofs. Though this is a comparison of extremes, it is indicative of how prestressed construction is regarded by insurance companies.

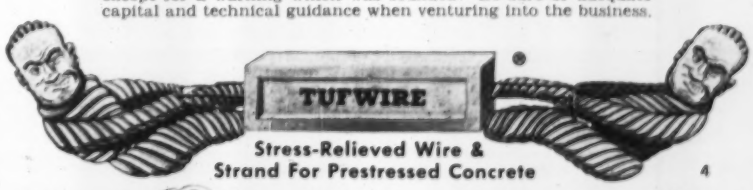
10. Economy of Maintenance

A. Even in marine construction or in construction subjected to other extreme corrosive conditions, the cost of maintenance on prestressed concrete construction ranges from nil to the expense involved in painting in cases where color is desired.

11. Widely Competitive

A. The initial cost of prestressed concrete is such as to enable its prefabricators to successfully bid against the permanent, fire resistant, all-weather types of construction in many types of structures.
B. When the collateral economies effected by prestressed concrete, such as greater and more flexible strength for longer spans and fewer columns, balanced stresses and strains and controlled deflection, thinner sections, lower depth to span ratios, lower wall heights and increased usable cubage, ready availability, speedier erection, negligible maintenance and lower insurance premiums are considered, then the competitive edge is definitely on the side of prestressed concrete for a growing list of structures.

So goes the summary of the thoughts of a panel of pioneers except for a warning which was sounded: Be sure of adequate capital and technical guidance when venturing into the business.



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4

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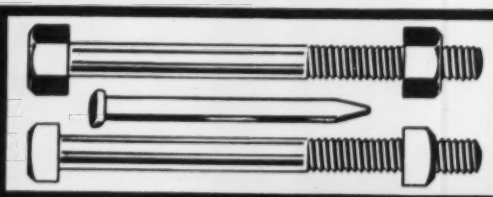
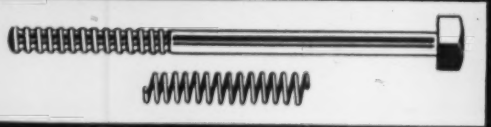
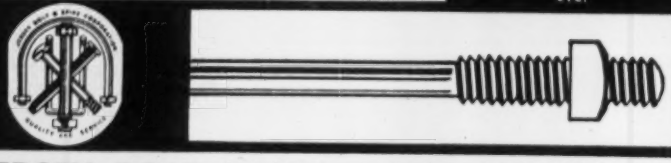




BOLTS, SCREW ANCHORS, TIE RODS, UPSET RODS, STRAPS, WASHERS, STAPLES, DOCK SPIKES, MANHOLE HARDWARE, ETC.



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Milwaukee and Twin Cities · Denver · New Orleans

(Continued from page 108)

steel WAREHOUSE, PHILA., PA. Perloff Bros., Inc., Whitaker Ave. and Cuyaga St., Phila., Pa. Bids June 10. CD 6/12.

▲† **John McShain, Inc.**, 17 and Spring Gardens St., Phila., Pa., LB **$35,394,200** Base Bid No. 1, LB **$34,273,000** Base Bid No. 2; State DEPARTMENT bldg. exten. and remodeling, WASH., D. C. General Services Admin. P. Bldg. Serv., General Service Bldg. 19 and F Sts. N. W., Wash. 25, D. C. Bids June 27. CD 6/19;

Haughton Elevator Co., 2117 "K" St. N. W., Wash., D. C., LB **$2,145,000** Base Bid. elevator plant, State Dpt. Bldg., 21 to 23 Sts., C to E Sts. N. W. (Wash., D. C.).

SOUTH

BUILDINGS—BA

† **W. Va., Ripley**—TRAINING CENTER—BA On Or About 7/30—U. S. Eng., P. O. Box 2127, Huntington, Army Reserve Training Center, ENG-46-022-58-1.

HEAVY CONSTRUCTION—LB & CA

† **VIRGINIA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Bids opened 6/27.

R. M. Cantrall & Sons, Annandale, Va., LB **$994,125**; (13 bidders) Proj. IN2, grading, drainage, crushed grav. or crushed stone base course, grade separation, structure and other work, 6.964 mi. Blue Ridge Parkway. CD 6/11.

▲† **Doyle & Russell**, 823 W. 21st St., Norfolk, Va., CA **$1,326,960**; Class "C" aircraft maintenance hangar, Naval Air Station, NBy 10672; Spec. No. 10672/57, OCEANA, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids June 18. CD 6/21, under LB.

Conquest, Moncure & Dunn, 208 E. Cary St., Richmond, 19, Va., CA **$801,026**, outside piping and misc. structures, sludge bed, sludge lagoons, outside piping, railroad siding and misc. structures, etc. as part of sewage disposal proj. at site of sewage treatment plant adjacent to southwest bank of James River at Rockett's Wharf northeast of U. S. Naval Diesel School, RICHMOND, VA. At office J. W. Huffman, dir. purchases and General Services, Mosque Bldg., Laurel and Main Sts., Richmond, Va. Bids May 21. CD 4/12.

WEST VIRGINIA—State Rd. Comn., 1800 Washington St. E., Charleston 5, Bids opened 6/25,

W. Va.—**Highway Constr. Co.**, 504 Baltimore Ave., Clarksburg, W. Va., LB **$121,313**, surf. treatment on b. conc. surf. 13.5 mi. of Judy Gap-Pochontas County line Rd. (W. Va. 28). Proj. 207-A(1), (2) & (3), 4-A & B, Pendleton Co.;

W. Va.—**Tri State Asphalt Corp.**, S. Broadway, Wheeling, W. Va., LB **$112,868**, wid'n and b. conc. surf. 5.5 mi. of New Martinsville-Paden City Rd. (W. Va. 2). S.P. 147-B, Wetzel Co.;

W. Va.—**Andersons', Inc.**, Box 3004, Charleston, W. Va., LB **$110,880**, wid'n. and surf. treatment 9.85 mi. Mill Point-Lewisburg Rd. (US 219), Proj. 136-A (1) A(2) & 219) to be let with Proj. 244-A & 39A & B, Pocahontas Co.;

W. Va.—**Central Asph. Paving Co.**, 1640 4th Ave., Charleston, W. Va., LB **$87,345**, surf. treatment on b. conc. surf. 9.7 mi. Oak Hill-Kincaid Rd. (W. Va. 61) Proj. 3693, Fayette Co.;

W. Va.—**Contractors, Inc.**, Buckhannon, W. Va., LB **$75,123**, surf. treatment 10.85 mi. Baker-Wardensville Rd. (W. Va. 55), Proj. 3442 A & B, Hardy Co. CD 6/17.

WEST VIRGINIA—State Rd. Comn., 1800 Washington St. E., Charleston 5, Bids opened 6/25,

W. Va.—**Harman Brothers**, Grafton, W. Va., LB **$190,080**, Pentress Bridge approaches (W. Va. 7) 1.098 mi. grade, drainage, traffic bound base crushed b. conc. bottom and wearing courses. Proj. S. 165(7), Cont. 1, Monongalia Co.;

W. Va.—**Paul Price**, 107 Harrison Court, Huntington, W. Va., LB **$95,135**, widening 3 concrete bridges (W. Va. 17), Proj. S 206(5) Contr. 1, Mason Co. CD 6/17.

▲† **NORTH CAROLINA**—Bureau P. Rds., Dpt. Commerce, 1440 Columbia Pike, Arlington, Va.,

A. B. Burton Co. Inc., 830 Church Ct., Lynchburg, Va., LB **$1,307,959** (9 bidders) Proj. 2X2, crushed grav. or stone base course and other work, 6.044 mi. from Fork Ridge to Soco Gap, Blue Ridge Parkway. Bids June 25. CD 6/11.

† **C&L Eng. Co.**, New Bern, N. C., LB **$165,574**, drainage project in vicinity of Fairfield, Hyde Co., N. C., ENG-31-075-57-47, NORTH CAROLINA. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids May 21. CD 4/12.

▲† **Diamond Constr. Co.**, 9801 Hampton Blvd., Norfolk, Va., LB **$2,184,856** (12 bidders) aircraft parking areas, seaplane ramps and bulkheads, Seaplane Facility, NBy 7740, Spec. 7740/57. HERTFORD, N. C. P. Wks. Office, Fifth Naval Dist. U. S. Naval Base, Norfolk 11, Va. Bids June 27. CD 6/7.

SOUTH CAROLINA—State Hy. Dpt., C. R. McMillan, ch. hy. comr., Columbia,

S. C.—**Ralph W. Crowe**, Woodruff, S. C., CA **$103,487**, grading, paving 8.883 mi. various roads, Proj. No. S-1107 (1), Larens Co.; CA **$108,918**, grading, paving 6.966 mi. roads S-16 and S-18, Projs. Nos. FA-49-A & FH-50-B, Union Co.;

S. C.—**Wallis Constr. Co.**, Pickens, S. C., CA **$86,042**, grading, paving 5.934 mi. various roads, Projs. Nos. S-323 (3) & S-940(2), Pickens Co.;

S. C.—**P. C. Cochran**, York, S. C., CA **$434,038**, grading, paving 9.35 mi. U.S. 29. F. A. Proj. No. I-301-2(8), Cherokee and Spartanburg Counties;

S. C.—**Coates-Shull Paving Co.**, West Columbia, S. C., CA **$168,029**. grading, paving 13.98 mi. various

(Continued on page 115)

Note how the uppermost rail has been elliptically rolled. The wide range of wrought iron pipe sizes and forming methods available assures design flexibility.

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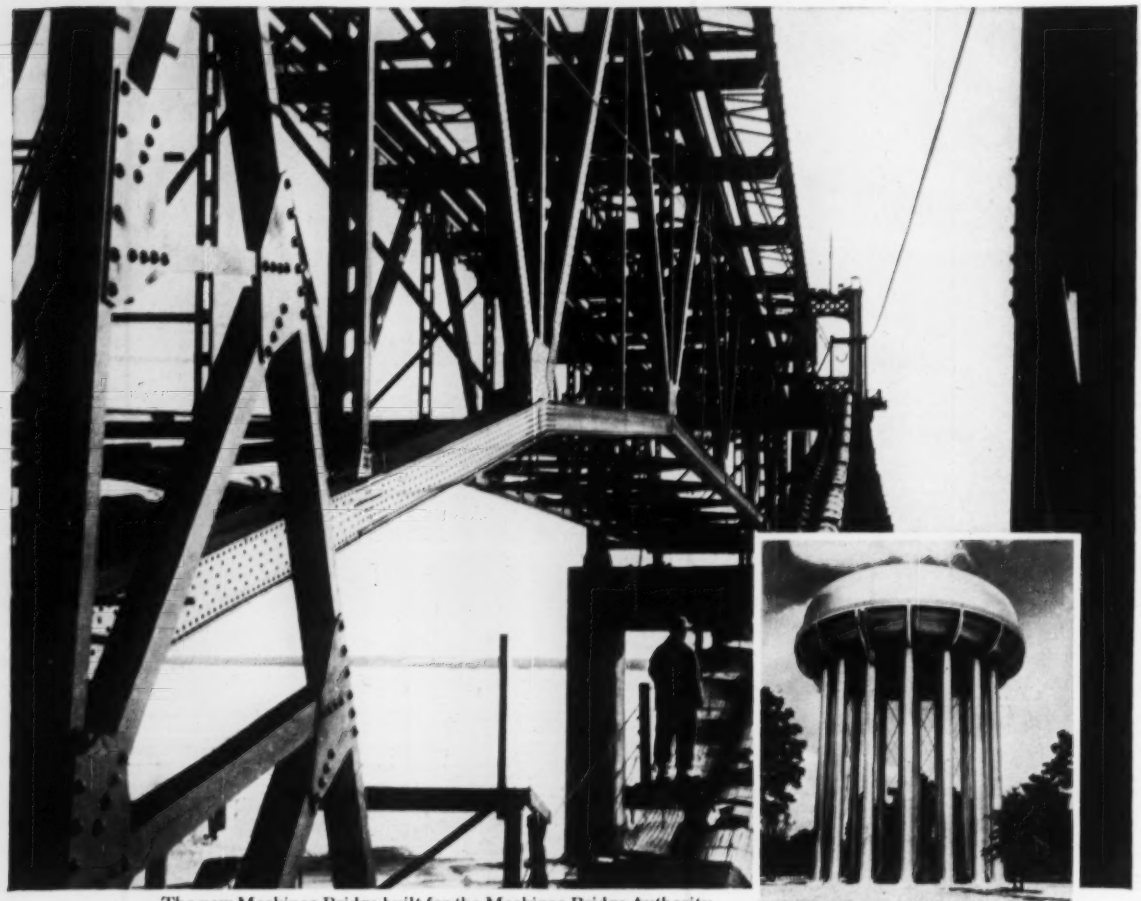

The new Mackinac Bridge built for the Mackinac Bridge Authority will connect Michigan's upper and lower peninsulas with a modern, high-speed traffic artery. Red lead base primer paint was specified. Dr. D. B. Steinman—Consulting Engineer.

This new 2-million-gallon standpipe at Shreveport, La., is protected with red lead primer paints.

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We will be glad to assist you with specific formulations to meet your particular requirements, whether for highway structures or steel installations of any kind. We have available a series of Red Lead Technical Letters that deal with specific problems involving the priming of structural steel. Technical Letter No. 12, for example, is concerned with painting highway steel structures. Write for it today – on your letterhead.

427a

RELY ON RED LEAD—THE STANDARD FOR STEEL PROTECTION

Lead Industries Association

60 East 42nd Street New York 17, N. Y.

(Continued from page 112)

county roads and Columbia city roads, Projs. Nos. S-506(3), S-1064(1) & S-1067(1), Richland Co.;

S. C.—**Satterfield Constr. Co.**, Greenwood, S. C., CA **$184,061**, grading, paving 16.035 mi. county roads, S. C. Docket No. 41.305, Saluda Co.;

S. C.—**Fox Constr. Co.**, Lexington, S. C., CA **$101,577**, grading, paving 3.19 mi. Roads 23, 249 and 181. Projs. S-753(1) & F 2534 (6), Beaufort Co.;

S. C.—**Banks Constr. Co., Inc.**, 2013 Reynolds Ave., Charleston Heights, S. C., CA **$204,609**, grading, paving 11.235 mi. of various roads, S. C. Dockett No. 10.446, Charleston Co.;

S. C.—**Kraft & Newell**, Florence, S. C., CA **$148,540**, grading, paving 14.825 mi. county roads, FA Projs. Nos. S-424(3) & S 670(2), Dillon Co. Bids June 18. Grand total $1,539,301. CD 6/6.

▲ FLORIDA—State Rd. Dpt., Tallahassee,

Fla.—**Hubbard Constr. Co.**, Box 7217, Orlando, Fla., CA **$598,319**, limerock base, primed, b. conc. surf. with binder, small drainage structure 3.848 mi. from French Ave. at Sanford, south city limits, S.P. Job 7701-113, SR 15 and 600, Seminole Co.;

Fla.—**Ballenger Paving Co.**, Paris, S. C., CA **$2,486,083**, c. conc. pavement, limerock base with bit. surf. tr., limerock base with b. conc. surf. course, double overpass bridges over SAL RR tracks and SR. 39, 3 double grade separation bridges over Alexander St., Park Rd. and Taylor Rd., drainage structures etc. 4.754 mi. FA Proj. IN-104-1 (2), Job 1019, 202 SR 600, Hillborough Co. Bids May 16. CD 5/23, under LB.

▲ FLORIDA—State Rd. Dpt., Tallahassee,

Hardaway Constr. Co., Box 1360, Columbus, Ga., CA **$2,070,276**, 1 bridge providing two 21 ft. roadways, and two 5 ft. sidewalks, designated at structure A; 2 parallel bridges each providing 24 ft. roadway and two 5 ft. sidewalks designated at Structure "B" Ringling Causeway Bridge across Sarasota Bay, SR 780, Job 1730-175, Sarasota Co. Bids May 24, awarded June 17. CD 5/29, under LB.

▲ FLORIDA—State Road Dpt., Tallahassee,

Fla.—**Heavy Constructors Inc. and Powell Bros. Inc.**, Box 281, Fort Lauderdale, Fla., CA **$926,422**, bridge and approaches, easterly end of MacArthur Causeway, SR A-1-A, U-039-1 (4) (Job 8706-203) Dade Co. CD 6/11, under LB;

Fla.—**Industrial Constr. Co.**, Box 2248, Jacksonville, Fla., CA **$1,425,970**, 1,458 ft. dual-lane bridge consisting of precast, prestressed, concrete beams with pour-in-place concrete deck on pedestal piers or concrete pile bents; roadway lighting, navigation lights, 1.154 mi. Trout River Bridge and approaches, S.P. Job 720-51113, S.R. 5, Duval Co.;

Fla.—**Cleary Bros. Constr. Co.**, Box 6397, West Palm Beach, Fla., CA **$1,487,371**, reconstr. existing 1,055 ft. concrete bridge incl. concrete slab deck wid'n. on pedestal piers supported by composite concrete piling, replacing existing swing type span with four lane rolling lift electrically operated double-leaf bascule span, concrete sheet pile bulkheads 0.349 mi. light embankment limerock base b. conc. surf. Royal Park Bridge and approaches over Intracoastal Waterway in West Palm Beach, S.P. Job 9352-150, SR 704, Palm Beach Co. Bids May 16. CD 5/23, under LB. Grand total $3,839,763.

† **Nat G. Harrison Jr. & Assocs.**, 5137 NE 2 Ave., Miami, Fla. LB **$148,800**, (Item 1) LB **$134,153** (Item 2) addnl. base facilities, Air Force Missile Test Center Offshore Facilities, San Salvador Island, NBy 10333, Spec. 10333/57, BAHAMAS. Resident Officer in Charge of Constr., Bureau Yards & Docks, Contracts, P. O. Box 956, 245 Alcazar Ave., Coral Gables 34, Fla. Bids June 28. CD 6/21.

▲† **Charles R. Shepherd, Inc.**, Doraville, Ga., CA **$1,892,258**, constr. 2,900 ft. runway extension, taxiway apron and hangar access apron, Air Reserve Jet Training Base, Bates Field, ENG-01-076-57-98; MOBILE, ALA. U. S. Air Force Reserve, Municipal Airport, Mobile, Ala. Bids June 20. CD 6/26, under LB.

Dpt. P. Wks., Capitol Annex, Baton Rouge, La., cancelled bids to have been opened May 20, Larto lake section 11, Big Bayou Dam, Big Bayou, Section 32, Catahoula Parish; boat dock and canal excav. near Old Fort Livingston, Jefferson Parish, LOUISIANA. CD 5/13.

BUILDINGS—LB & CA

Ivey A. Dorough, 819 S.W. 14 Court, Fort Lauderdale, Fla., LB **$635,000**. 26-buildings, 104-units, co-operative APARTMENTS, Cliff Lake, S.E. 15 St. and Cordova Rd., FORT LAUDERDALE, FLA. Mr. William Seltzer, 1616 Salzedo Dr., Coral Gables, Fla. CD 4/4.

Tompkins-Beckwith, Inc., 2628 Pearl St., Jacksonville, Fla., CA air conditioning and ventilating work for MANUFACTURING and OFFICE BLDG., WEST PALM BEACH, FLA. Pratt & Whitney Aircraft Div. of United Aircraft Corp., P. O. Box 2691, West Palm Beach, Fla. Bids May 14. CD 5/13;

Lorne Plumbing & Heating Co., Inc., 641 W. Congress St., Detroit, Mich., CA steam and cooling water piping for mfg. and office (West Palm Beach, Fla.).

Huffman-Wolfe Southern Corp., 408 South St., Atlanta, Ga., CA plumbing work for mfg. and office bldg. (West Palm Beach, Fla.).

A. S. Schulman Electric Co. of Florida, 2905 Grand Central Ave., Tampa, Fla., CA electrical work for MANUFACTURING and OFFICE BLDG., WEST PALM BEACH, FLA. Pratt & Whitney Aircraft Corp., Div. of United Aircraft Corp., P. O. Box 2691, West Palm Beach, Fla. Bids May 20.

▲† **Howard P. Foley**, 228 Isabella St., Pittsburgh, Pa., LB **$1,289,202**. (6 bidders) 2 story, 122,000 sq. ft. ACCEPTANCE TEST AND QUALIFICATION BLDG., Redstone Arsenal, ENG-041-076-57-105, HUNTSVILLE, ALA. Army Missile Center, Redstone Arsenal, Huntsville, Ala. Bids June 27, CD 6/18.

▲ **Daniel Constr. Co., Inc.**, 822-7th Ave., S., Birmingham, Ala., LB **$1,206,910**, (7 bidders) 3 story, rein.-con., 20,000 sq. ft. ENGINEERING MISSION SUPPORT BLDG., Redstone Arsenal, HUNTSVILLE, ALA. Guided Missile Center, Redstone Arsenal, Huntsville, Ala. Bids June 26. CD 6/18.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Ill., **Chicago**—BA 7/18—City, City Hall, Section A, filter equipment constr. for Central Dist. Filtration Plant. CD 1/30/51.

† **Illinois**—SENTRY BOXES, etc.—BA 7/19—U. S. Eng., 475 Merchandise Mart, Chicago, Zone 54, entrance imprvs. incl. 5 concrete block and stone sentry boxes, approx. 140 lin. ft. stone faced walls and associated site grading, electrical work and fence relocation, Special AAA Sites, C-03, C-40 & C-41, ENG-11-032-57-92. CD 6/9/55.

BUILDINGS—BA

† **O., Bryan**—TRAINING CENTER—BA 7/23—U. S. Eng., 237 4 Ave., Huntington 18, W. Va., Army Reserve Training Center, Serial No. ENG-46-022-57-36. CD 6/20.

▲ **Wis., Madison**—STERLING HALL—BA 8/1—University of Wis., constr. Sterling Hall addn. $1,200,000, Grellinger & Rose, 757 N. Broadway, Milwaukee, archts. CD 9/19.

HEAVY CONSTRUCTION—LB & CA

L. P. & H. Constr. Co., Linton, Ind., CA **$92,559**, (6 bidders), rural telephone project incl. 80.05 mi. telephone lines Proj. Ind. 532A Cutler INDIANA. Cutler Cooperative Telephone Co., Cutler Ind. Bids June 20. CD 5/31.

▲ **ILLINOIS**—State Toll Hy. Comn., 20 N. Wacker Dr., Chicago,

Hedges Constr. Co., 5915 N. Rogers St., Chicago, Ill. and **Ryan Bros. Co.**, Janesville, Wis., LB **$4,995,745**. Contr. T-6-A, grading, drainage, paving, appurtenances, erecting precast-structural steel bridges 2.98 mi. W. of Midwest Rd., extending E. to So. of Roosevelt Rd. Bids June 13. CD 5/24.

Lake Shore Contractors, Inc., 1900 Sherman Ave., Northbrook, Ill., CA **$116,513**, D4, force main, Winthrop Harbor to Zion; CA **$73,178**, D6 intercepting sewer, WAUKEGAN, ILL. North Shore Sanitary Dist., Dahringer Rd., Waukegan, Ill. Grand total, $329,598. Bids May 21. CD 5/20;

Porter Contg. Co., 125 N. Clay St., Hinsdale, Ill., CA **$139,908**, Winthrop Harbor Pumping Station (Waukegan, Ill.)

† **Shaw & Estes**, 1407 S. Akard St., Dallas, Texas, CA **$185,035**, jet engine concrete test cell bldg. and installing, erecting control house and equip. at Truax Field, ENG-11-032-57-95, MADISON, WIS. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids May 21. CD 5/1.

Milwaukee General Constr. Co., 4580 S. 13 St., Milwaukee, Wis., CA **$113,906**, paving W. Morgan, W. Villard, W. Bolivar and N. 65th to Grantosa, MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids June 7, awarded June 18. CD 10/23.

W. J. Lazynski, Inc., 4445 N. 124 St., Milwaukee 16, Wis., CA **$451,946** (2 bidders), main sewer in N. 91 St., Brown Deer, MILWAUKEE, WIS. Metropolitan Sewerage Comn. of County of Milwaukee, Jones Island, Milwaukee, Wis. Bids June 17. CD 6/10.

▲† **Great Lakes Dredge & Dock Co.**, 228 N. La Salle St., Chicago, Ill., CA **$10,816,320**, Middle Neebish Channel, deepening, removing 4 mile stretch of rock from channel upper end of Neebish Island to Sugar Island, St. Mary's River, MICHIGAN. U. S. Eng., 1101 Washington Blvd., Detroit, Mich. Grand total $19,275,050. Bids June 4. CD 6/12, under LB;

Dunbar & Sullivan Dredging Co., 2312 Buhl Bldg., Detroit, Mich., CA **$7,259,260**, Middle Neebish Channel Deepening, 3½ mi. stretch of rock bottom, lower end of Neebish Island, St. Mary's River, (Michigan);

Price Bros & McClung, 1932 E. Monument St., Dayton, O., CA **$1,199,470**, Middle Neebish Channel Deepening, Hydraulic Dredging 7½ mi. of channel, St. Mary's River, (Michigan).

E. H. Wittman Constr. Co., Inc., 81 Chestnut St., Wyandotte, Mich., CA **$425,500**, swimming pool for Lower-Huron Metropolitan Park, No. 506-57 D, DETROIT, MICH. Huron-Clinton Metropolitan Auth., 1750 Guardian Bldg., Detroit, Mich. Bids May 2, awarded June 13 (Correction—cost). CD 6/11, under CA.

Mr. Hessel Boschma, 1788 Rosemont St., Berkeley, Mich., CA **$159,872**, sewer and water facilities for Lower-Huron Metropolitan park No. 506-57 E, DETROIT, MICH. Huron-Clinton Metropolitan Auth., 1750 Guardian Bldg., Detroit, Mich. Bids May 2, awarded June 13. CD 4/15.

Richart, Dryer & Endress Co., 301 N. Franklin St., Flint, Mich., CA **$446,450**, service center bldg. to house water facilities, FLINT, MICH. City, Albert C. Hall, dir. Purchases, Flint, Mich. Bids May 28. CD 5/20.

K. G. Marks, Port Huron, Mich., CA **$285,793**, No. 1, structures, equip., piping, wiring, sewage treatment plant, MARLETTE, MICH. Village, Cecil Dawson, clk., Village Hall, Marlette, Mich. Bids May 16. CD 5/8;

Limberg Excavation Co., Port Huron, Mich., CA **$121,478**, No. 2, interceptor sewer, manholes, etc., (Marlette, Mich.)

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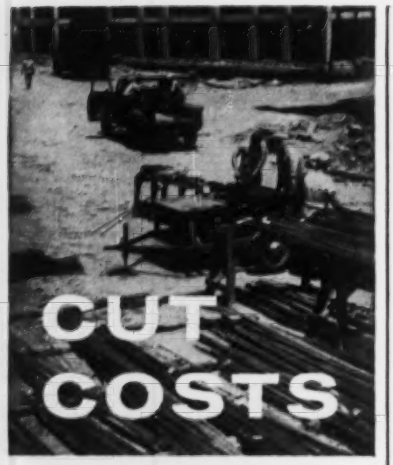

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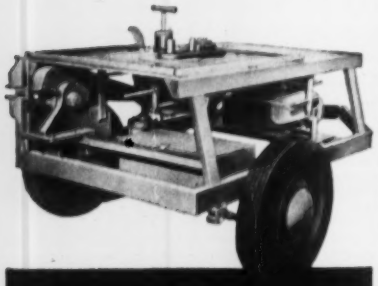

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BUILDINGS—LB & CA

Gillmore-Olson Co., 1873 E. 55th St., Cleveland 3, O., LB Est. $500,000. 1 story brick, aluminum OFFICE, 40,000 sq. ft. WAREHOUSE, to house distr. branch of E. R. Squibb & Sons division of Olin Mathison Chemical Co., CLEVELAND, O. Marx Realty Co., 20 W. 43 St., New York, N. Y. Toombs, Amisano & Wells, 70 Fairlie St. N.W., Atlanta, Ga., archts.

▲ **Victory Constr. Co.**, Knott Bldg., Dayton, O., CA $1,265,632 (2 bidders) Proj. 15-2, 26 two story low-income HOUSING, HAMILTON, O. Hamilton Metropolitan Housing Auth., 1005 S. Front St., Hamilton, O. Awarded June 24. CD 6/21, under LB.

Paugh & Brown, 6007 Euclid Ave., Cleveland 3, O., LB Est. $300,000. combination WAREHOUSE and OFFICE, Fry Rd. and B. & O. RR. tracks, MIDDLEBURGH HEIGHTS, O. Ohio Fuel Gas Co., 109 N. Front St., Columbus, O. CD 1/31.

W. H. Dick Constr. Co., 17206 Miles Ave., Cleveland 28, O., CA Est. $375,000. St. Bridget's Catholic CHURCH, Hauserman Rd., PARMA, O. Catholic Diocese of Cleveland, 1027 Superior Ave., Cleveland 14, O. CD 1/24.

Humel Builders Inc., 17706 Miles Ave., Cleveland 28, O., CA $618,000. POLICE STATION, SHAKER HEIGHTS, O. City, City Hall, 3400 Lee Rd., Shaker Heights 20, O. Bids June 21, awarded June 24. CD 6/26, under LB.

R. H. Sommer Co., 2313 N. 35 St., Milwaukee, Wis., CA $500,000, 89,000 sq. ft. FACTORY and OFFICE, ANTIOCH, ILL. Quaker Strecher Co., 2410 60 St., Kenosha, Wis.

▲ **Stelzmer Constr. Co.**, 5500 W. Lawrence Ave., Chicago, Ill., Own Forces. $1,680,000. 85 HOMES, ARLINGTON HEIGHTS, ILL. Harry Johnson, 4850 N. Winchester, Chicago, Ill., archt.

Utility Builders, 6633 W. Irving Park Rd., Chicago, Ill., Own Forces. $600,000. 40 HOMES, BENSENVILLE, ILL. D. Marcus, 6633 W. Irving Park Rd., Chicago, Ill., archt.

O. & O. Constr. Co., 20 Greenbay Rd., Winnetka, Ill., CA $551,526, 2 story brick HIGH SCHOOL addn., GRAYS LAKE, ILL. Grays Lake Comm. High School Dist. 127, 400 N. Lake St., Grays Lake, Ill. CD 6/17, under LB.

† **Maurek & Son, Inc.**, 3128 S. Austin Ave., Cicero, Ill., CA $487,000. 18 unit TRANSIENT HOUSING facilities, Argonne National Laboratory, LEMONT, ILL. U. S. Atomic Energy Comm., Chicago Operations Office, P. O. 59, Lemont, Ill. Hirschfield & Pawlan, 327 S. LaSalle St., Chicago, Ill., archts. CD 10/18/53.

▲ **LaSalle Constr. Co.**, 343 So. Dearborn St., Chicago, Ill. and **American Bridge Div., U. S. Steel Corp.**, 208 S. LaSalle St., Chicago, Ill., CA $24,000,000. steel MILL BLAST FURNACES, 135th and Perry Sts., RIVERDALE, ILL. Acme Steel Co., 135th St. and Perry Ave., Riverdale, Ill. John Mohr & Sons, 3200 E. 96th St., Chicago, Ill., consult. engrs.

▲ **Spear-O-Constr. Co.**, 7619 Armitage Ave., Elmwood Park, Ill., Own Forces. $2,793,000. 133 HOMES, WHEATON, ILL. A. J. Del Bianco, 5501 W. Irving Park, Chicago, Ill., archt.

▲ **Howe Constr. Co.**, 215 Monroe Falls, O., CA Est. $3,600,000. 52 store SHOPPING CENTER, incl. parking facilities, Burton S.E. and Beltline, GRAND RAPIDS, MICH. Rex E. Holt Realtors, Norman Holt, Grand Rapids, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

Minnesota—ELECTRIC SUPPLY SYS.—BA 7/18—U. S. Eng., 1217 Post Office and Custom House, St. Paul, addns., alterations to electric supply and appurtenances at Air Force Station at Chandler, Wadena and Finland, ENG-21-018-57-26. Plans deposit $10. CD 6/28.

† **South Dakota**—BA 8/7—U. S. Eng., 1709 Jackson St., Omaha, Neb., substructure C. M. St. P. & Pacific R.R. Co., Missouri River Bridge, Inv. 25-066-57-125.

† **Wyoming**—BA 8/8—Bureau Reclamation, Dpt. Interior, Cody, Left Abutment Outlet Works and rehabilitation of penstock intakes, Shoshone Proj., near Cody, Spec. DC-4936, adv. ENG 7/11. CD 5/25/44.

HEAVY CONSTRUCTION—LB & CA

H & H Constr. Co., Gravette, Ark., CA $45,305, general contract, distribution sys. and pump house, DUENWEG, MO. City, City Hall, Duenweg, Mo. Bids May 15. CD 3/5/56.

ARKANSAS—State Hy. Dpt., State Capitol, Little Rock.

D. B. Hill Contractors, 619 Parker St., Little Rock, Ark., CA $611,298, est. $900,000 (for 3 jobs) (1) relocation 6¼ mi. State Hy. 10 between Worthen Creek and Bingle Creek, for Little Rock Waterworks Comm., Pulaski Co. Bids June 21, awarded June 22. CD 6/20.

† **Wooten Constr. Co.**, 3322 Roosevelt Rd., Little Rock, Ark., LB $79,190, est. $87,461, 1 story, 2,500 sq. ft. with concrete foundation and floors, COLD STORAGE WAREHOUSE, Item No. M-048 (N110) Bldg., ENG-03-050-57-42, BLYTHEVILLE, ARK. U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids May 23. CD 4/29.

Ben M. Hogan & Co., 1100 Fairview, Little Rock, Ark., LB $135,438. est. $127,528. constr. 275 x 422 ft. extension to existing aircraft parking apron, ENG-03-050-57-50, FORT SMITH, ARK. U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids June 20, CD 6/17.

Peterson, Garbi & Joseph, Inc., 123 E. 9th St., North Little Rock, Ark., LB $199,134, est. $178,942. constr. training facility, Hot Springs Memorial Airport, ENG-

(Continued on page 118)

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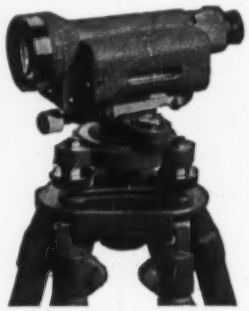

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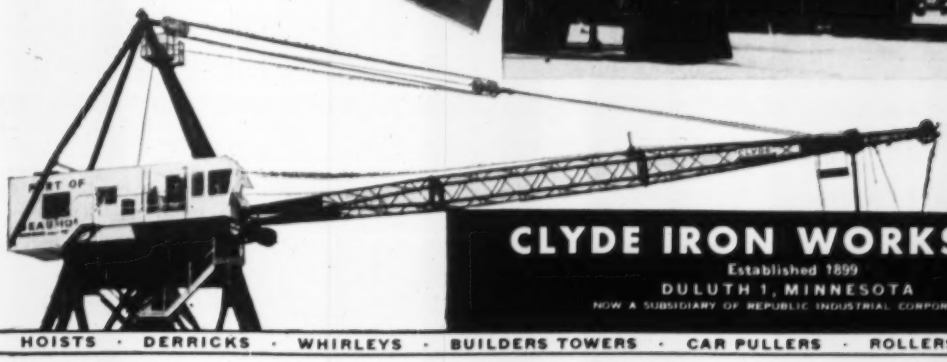

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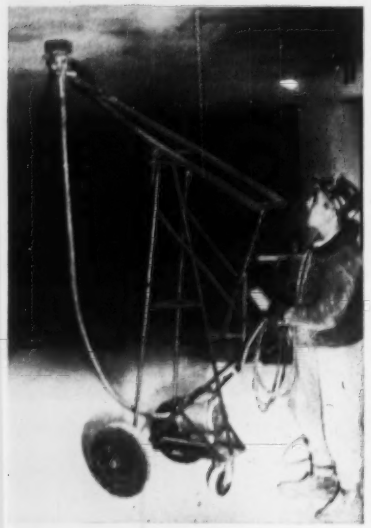

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(Continued from page 116)

03-050-57-47, HOT SPRINGS, ARK. U. S. Eng., P. O. Box 867, Little Rock, Ark. Bids June 21, CD 6/7.

† **Schultz & Lindsay Constr. Co.**, 320½ Broadway, Fargo, N. D., LB $76,711, topsoiling, seeding, mulching and erosion control Garrison Dam & Reservoir Proj., Inv. 32-015-57-56, NORTH DAKOTA. U. S. Eng., Riverdale, N. D. Bids May 29. CD 5/14.

Ulvedal & Hilde, 919 N 32 St., Grand Forks, N. D., LB $312,324, car parking building and paving, GRAND FORKS, N. D. City, City Hall, Grand Forks, N. D. Bids June 17. CD 6/7.

† **Soil Conservation Service**, 134 S. 12 St., Lincoln, Neb., received no bids June 17, grade dams, Brownell Creek Watershed, one in Oteo Co. and one in Gage Co. near Syracuse, No. 42-NB-57, NEBRASKA. CD 5/28.

▲† **Peter Kiewit Sons' Co.**, Omaha Natl. Bank Bldg., Omaha, Neb., CA $1,845,453, Sch. 1; CA $1,858,722, Sch. 2; CA $2,092,642 Sch. 3 operation apron, Offutt Air Force Base, FORT CROOK, NEB. U. S. Eng., 1709 Jackson St., Omaha, Neb. Grand total $5,796,817. Bids June 12. CD 6/20, under LB.

Bud Anderson Plumbing, Holdrege, Neb., CA $106,966 sewers, pumping station, KEARNEY, NEB. City, City Hall, Kearney, Neb. Bids May 23. CD 5/20.

TEXAS—State Hy. Comn., Austin,

Strain Bros., Inc., Box 1631, San Angelo, Tex., CA $537,939, flex. base and b. conc. 31.067 mi. Hy., SH 302 Proj. S 202 (2) Winkler and Ector Counties. CD 6/24, under LB.

Jasper-Newton Electric Co-operative, Jasper, Tex., Owner Builds. $90,000. rural pole line, Jasper, Orange, Jasper and Newton Counties, TEXAS. CD 1/4/54.

† **W. V. Wright Constr. Co.**, Box 9688, Dallas 14, Tex., LB $126,169, est. $100,000, repair joints and underseal taxiway aprons, Harlingen Air Force Base, Inv. No. 41-644-57-40, HARLINGEN, TEX. U. S. Dpt. Air Force, c/o Base Procurement Office, Bldg. S-466, Harlingen, Tex. Bids June 3, CD 10/20/54.

▲ **Southern Pacific Railway Co.**, 913 Franklin St., Houston, Tex., Purchase and Hire. $2,500,000. 48-track classification yards (radar controlled tracks), $175,000. flood-lighting areas of 300 acre yards; $135,000. communications network; $145,000. service bldg. units, HOUSTON, TEX. Grand Total $2,955,000. CD 2/27/53.

Cherokee County Rural Rd. Dist. No. 1, Cherokee Co., Jacksonville, Tex., Purchase and Hire. $100,000. some rural road improvs. and extensions, JACKSONVILLE, TEX. CD 5/9/56.

City, City Hall, Odessa, Tex., Force Account. $100,000, street drainage, resurf. reworking, ODESSA, TEX. CD 10/24.

Colglazier Constr. Co., Box 95, Grayson St. Station, San Antonio, Tex., LB $96,769, est. $75,000. resurf., reconstr. paving on S. Laredo St., SAN ANTONIO, TEX. City, City Hall, San Antonio, Tex. V. P. Newman, city engr. Bids June 20. CD 6/18.

▲ **Texarkana Constr. Co., Box 1079, Texarkana, Tex.**, LB $424,192, Contract 1, lake pump station, TEXARKANA, TEX. City, c/o A. P. Miller, mayor, Texarkana, Tex. Bids June 26, CD 5/27;
Ham Constr. Co., 7406 Moline St., Houston 17, Tex., LB $622,348, Contract 2, raw water supply (Texarkana, Tex.);
Elm Fork Constr. Co., 1518 Kings Hy., Dallas, Tex., LB $954,674. Contract 3, water purification plant; LB $166,033. Contract 4, treated water supply main (Texarkana, Tex.);
Layne-Texas Co., John West Rd., Dallas, Tex., LB $70,089. Contract 5, pumping equipment (Texarkana, Tex.).

F. J. Kirchhof Constr. Co., 700 Lawrence St., Denver, Colo. LB $797,100, 1 story, 4,500 crypt mausoleum, DENVER, COLO. Fairmount Cemetery, 515 Security Bldg., Denver, Colo. Gordon D. White & Charles N. Overholt, 615 Columbine St., Denver, Colo., engr.-archts.

BUILDINGS—LB & CA

Rinderknecht Constr. Co., Cedar Rapids, Iowa, CA $363,500, general contract, Hiawatha Elementary SCHOOL, CEDAR RAPIDS, IOWA. Bd. Educ., Cedar Rapids, Iowa. Bids June 12. CD 6/3.

▲ **D. C. Bass Constr. Co.**, 14-316 Bass Bldg., Enid, Okla., LB $2,629,928 (4 bidders), general contract, three 9 story 28 x 126 ft. DORMITORIES, and one story 98 x 120 ft. CAFETERIA, to connect with dormitories by enclosed passageway at Kentucky and Maryland Aves., COLUMBIA, MO. Curators University of Missouri, Dale O. Bowling, bus. mgr., 116 Jesse Hall, Columbia, Mo. Bids June 18. CD 5/22;
J. Louis Crum, Boone Bldg., Columbia, Mo., LB $1,135,418 (3 bidders), plumbing, heating and air-conditioning for dormitories and cafeteria at University of Missouri, (Columbia, Mo.);
Evans Electric Co., 1626 Walnut St., Kansas City, Mo., LB $377,444 (3 bidders), electrical work for dormitories and cafeteria at University of Missouri, (Columbia, Mo.);
E. J. Fischer, 4134 Westminster Place, St. Louis 8, Mo., LB $595,000, plumbing work for dormitories and cafeteria at University of Missouri, (Columbia, Mo.);
J. Louis Crum, Boone Bldg., Columbia, Mo., LB $718,778, heating work for dormtiories and cafeteria at University of Missouri, (Columbia, Mo.)

Felton A. Richardson, Developer, Baytown, Tex., Purchase and Hire. $360,000 20 DWELLINGS; $378,150 23 DWELLINGS, BAYTOWN, TEX.

▲ **Thomas S. Byrne, Inc.**, Fort Worth National Bldg., Fort Worth, Tex., CA $2,252,232, 4 story brick tile, concrete, steel HOSPITAL, FORT WORTH, TEX. All Saints Hospital, c/o Ray Holmes, chrn. Bldg. Comm., 1525 W. Magnolia St., Fort Worth, Tex. Bids June 12. CD 6/14, under LB.

▲ **A. M. Oakes Constr. Co.**, 2230 Bissonnet St., Houston, Tex., CA $675,000. facilities for doubling Cresylic Acid production; shop, laboratory, office maintenance bldg., HOUSTON, TEX. Jefferson Lake Sulphur Co., c/o San Jacinto Bldg., (Merichem Div.) Houston, Tex. CD 10/24;
Brown & Root, Inc., Box 3, Houston, Tex., CA Est. $325,000. constr. concrete foundations for machinery and equipment and installing (Houston, Tex.).

G. D. Hines Constr. Co., c/o Worth Realty Co., Prudential Bldg., Houston, Tex., CA $100,000. AUTO AGENCY SHOP, HOUSTON, TEX. C. D. Hines, c/o Worth Realty Co., Prudential Bldg., Houston, Tex. CD 6/24.

† **U. S. Eng.**, 1709 Jackson St., Omaha, Neb., cancelled bids to have been opened June 25, three E. M. BARRACKS, Inv. 25-066-57-79, CAMP CARSON, COLO. CD 6/11.

▲† **L. R. Foy Constr. Co.**, 234 W. 4 St., Hutchinson, Kan., LB $1,713,197. Sch. 1; LB $1,695,622. Sch. 2; weapons maintenance shop and warehouse, Pueblo Ordnance Depot, Inv. 25-066-57-43, PUEBLO, COLO. U. S. Eng., 1709 Jackson St., Pueblo, Colo. Bids June 25. CD 6/7.

FAR WEST

HEAVY CONSTRUCTION—LB & CA

† **J. P. Hopkins Co.**, Mercer Island, Seattle, Wash., LB $207,859 (2 bidders) install twelve 2,000 gal. underground fuel oil tanks, asphaltic concrete surf. parking areas and roads, drainage, water tanks, pumphouses, etc. for facility modifications in Seattle defense area, ENG-45-108-57-151, SEATTLE, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 20. CD 6/3.

† **U. S. Eng.**, 4735 E. Marginal Way, Seattle 4, Wash., cancelled bids to have been opened June 25, two 39x148 ft. rein.-con. ADC type underground ammo storage mags. with utilities, 21x42 ft. security guard house, etc. at McChord Air Force Base. Inv. 45-108-57-161. TACOMA, WASH. CD 6/7.

† **Technical Constr., Inc.**, Box 2488, Dallas, Tex., LB $179,500, est. $190,687 (7 bidders) 2200 sq. ft. rein.-con. Jet test cell with 15000-gal. water storage tank at McChord Air Force Base, ENG-45-108-57-149, TACOMA, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 18. CD 5/27.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 6/26,

Frederickson & Watson Constr. Co., 873 81st Ave., Oakland, Calif., LB $1,742,222 (9 bidders) grading, surf. 1.4 mi. 6 lane divided Freeway on U. S. 101 between 0.4 mi. north of Calif. Park overhead and Greenbrae in Larkspur, incl. 2 parallel rein.-con. girder bridges comprising Calif. Park Overhead IV Mrn. 1, C, LKSP. Marin Co. CD 6/4.

▲ **J. Early Co., Inc., & Peter Kiewit Sons Co.**, 345 Kieways Ave., Arcadia, Calif., CA $4,020,579. enlarging Hyperion Treatment Plant, 4 primary clearifiers, new rein.-con. headwork, bldg., etc., LOS ANGELES, CALIF. City Council, City Hall, Los Angeles, Calif. Bids May 22. CD 5/24, under LB.

BUILDINGS—LB & CA

▲ **George E. Teufel**, White Henry Stuart Bldg., Seattle, Wash., LB $1,332,000. general contr. CITY LIGHT BLDG. addn., SEATTLE, WASH. Bd. P. Wks., City-County Bldg., Seattle, Wash. Bids June 26. CD 5/20.

Carvers Constr. Co., P. O. Box 484, Stockton, Calif., CA $467,750 (9 bidders) 60 units low rent HOUSING Diablo Homes Development, TRACY, CALIF. Housing Authority of San Joaquin Co., c/o Exec. Director, 2436 South Belleview St., Stockton, Calif. CD 9/26.

CANADA

HEAVY CONSTRUCTION—BA

▲ **Ont., Toronto**—BA 7/16—Ontario Water Resources Comn., East Block, Parliament Bldgs., Stage 1, sewerage scheme, Lakeview area, incl. sanitary trunk sewers, 12,000 lin. ft. 21- to 33-in. diam. concrete pipe and 4,120 lin. ft. 6 in. V.T. pipe for private drain. $2,000,000. Gore & Storrie Ltd., 1130 Bay St., engrs.

Ontario—BA 7/23—St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, dredging in Thousand Islands Section of St. Lawrence Seaway. A. G. Murphy, c/o owner, 685 Cathcart St., Montreal, Que., ch. engr.

Quebec—BA 7/23—St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Ottawa, Ont., supplying, installing bulkheads at locks of Seaway, Montreal. A. G. Murphy, c/o owner, 685 Cathcart St., Montreal, ch. engr.

HEAVY CONSTRUCTION—LB & CA

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Dravo of Canada Ltd., 159 Bay St., Toronto, Ont., CA $556,930 (only bidder) Contr. 57-32, sub-structure and approaches, Vernon Narrows Bridge, Hy. 11, Huntsville by-pass, Huntsville. Awarded June 24. CD 6/21, under LB.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Harvey Constr. Co. Ltd., R. R. 1, Kingston, Ont., CA $803,982 (6 bidders) Contr. 57-116, gran. base and hot mix paving 6.52 mi. Hy. 401, Cataraqui River east to Joyceville side road and connection to highway Joyceville. Awarded June 21. CD 6/28, under LB.

BUILDINGS—LB & CA

Alexis Nihon Cie Ltee, 6020 Cote de Liesse Rd., Montreal, Que., Owner Builds. $700,000. 3 story, 160x600 ft., concrete, structural steel frame WAREHOUSE and OFFICES, Cote de Liesse Rd. and new blvd. connecting

(Continued on page 120)

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(Continued from page 118)

with 25 Ave., Lachine, MONTREAL, QUE. Franco Consiglio, 1201 Guy St., Montreal, Que., archt. CD 1/10/55.

ALASKA

HEAVY CONSTRUCTION—LB & CA

† **Holert Electric Co. & Connolly Constr.**, Anchorage, Alaska, LB $76,900 Sch. 1; clearing land and right-of-way; $395,432, Sch. 2, transmission lines, relocation of 9 mi. Eklutna-Palmer 115-kv transmission lines, Eklutna Proj., Spec. DC 4916, ALASKA. Bureau Reclamation, Dpt. Interior, Anchorage, Alaska. Bids June 18. CD 5/16.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

▲ **VENEZUELA**—Ministry of P. Wks., Caracas, C. A. de Edificaciones, Centro Profesional del Este, Oficina 81, Sabana Grande, Caracas, Venezuela, LB $2,568,075, imprv. asph. paving 25 mi. stretch of Trunk Hy. No. 4 between Churuguara and Rio Tocuyo in Falcon State. CD 5/8/56.

U. S. POSSESSIONS

BUILDINGS—LB & CA

▲† **The Pacific Constr. Co., Ltd.**, 1192 Waianu St., Honolulu, Hawaii, LB $1,729,347 (6 bidders), 32 one story duplex units, family quarters, Schofield Barracks, HAWAII. U. S. Eng., Office of Honolulu Engineer, P. O. Box 2240, Honolulu, T. H.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., Hanford**—City, City Hall, voted bonds June 11, to acquire and imprv. private owned water sys. $3,000,000. CD 5/2.

▲ **Tex., Wichita Falls**—Wichita County Water Dist. No. 1, water suply reservoir-dam, (for domestic and industrial purposes) $10,000,000; water main—reservoir to city, $1,500,000; water pumping plant, $1,500,000. Freese & Nichols, 407 Danciger Bldg. Forth Worth, Tex., engrs. CD 6/20.

▲ **Fla., Miami**—City Comn., City Hall, sanitary sewers, Central Negro Trunk Main No. 3 and rebuilding Pump Station No. 5 and 6, $700,000; sanitary sewers on S. R. D. highways, $320,000; rebuilding Pumping Station No. 8, $75,000; sanitary sewers, portion of Pinemount Sanitary Sewer Dist. SR-344, $775,000; sanitary sewers, Lincoln Sanitary Sewer Distr. SR-343, $400,000; sanitary sewers, portion of Meade Sanitary Sewer District, SR-340, $775,000; sanitary sewers in N.W. 12 Ave. Sanitary Sewer Exten., $80,000; sanitary sewers, south shore Crest Sanitary Sewer Dist. SR-341, $800,000. CD 9/28/56.

▲ **Fla., Miami**—City Comn., City Hall, 3332 Pan American Dr.,
unsewered portion in general area between N. W. 10 Ave., N. W. 27 Ave. N. W. 32 St. and Miami River, $670,000;
Pinemount Sanitary Sewer District, bounded by N. E. 64 St., N. E. 79 St., Florida east Coast Railroad and N. W. 7 Ave., $750,000;
Lincoln Sanitary Sewer District, N. W. 0 Ave. from N. W. 11 St. to N. W. 36 St. and abutting unsewered area, $350,000;
portion of Natoma Sanitary Sewer District, bounded by N.W. 22 Ave., Atlaka St., Dixie Hy. and Biscayne Bay, $1,000,000;
Bryan Sanitary Sewer District bounded by S. W. 4 St., S. W. 22 St., S. W. 27 Ave. and S. W. 13 Ave., $1,500,000.
sanitary sewer, Central Negro Trunk Mains No. 3 and 4, $500,000;
areas requiring replacing and repairing of existing sanitary sewers, $1,000,000;
area proposed for improvements, $500,000;
repairing, rebuilding sewage pump station (city-wide) $1,000,000;
portion of Hollehan Sanitary Sewer District, bounded by S. W. 12 Ave., S. W. 9 Ave., S. W. 15 St. and S. W. 2 Ave. $1,000,000;
sanitary sewer district bounded by N. 54 St., N. 62 St., N. W. 2 Ave. and N. E. 2 Ave., $500,000;
sanitary sewer district bounded by N. W. 45 St., N. W. 54 St., N. W. 3 Ave. and Miami Ave., $500,000;
Belle Meade Sanitary Sewer District, bounded by N. E. 53 St., N. E. 78 St., F.E.C.R.R. and Biscayne Blvd. $1,000,000;
Sanitary sewer district, bounded by N. W. 45 St., N. W. 57 St., N. W. 3 Ave. and N. W. 7 Ave., $600,000.
Little River Sanitary Sewer District, bounded by N. E. 79 St., N. Miami Ave. and Little River $300,000. CD 9/28.

▲ **Mass., Scituate**—Town, Sewer Dpt., sewerage sys., $1,125,000 1958 constr.

▲ **Minn., St. Louis Park**—City, J. Justad, clk., storm sewer sys. for entire city, $6,000,000.

▲ **O., Cleveland**—City, City Hall, $3,000,000 bond election Nov. 5, east side incinerator. CD 11/9.

▲ **O., Painesville**—City, City Hall, bond election Nov. 5, storm sewers, $3,283,830. CD 11/12.

▲ **O., Shaker Heights**—City, 3400 Lee Rd., Zone 20, bond election Nov. 5, storm and sanitary sewers throughout city, $3,000,000. Gilbert Associates, Inc., 607 Washington St., Reading, Pa., consult. engr. CD 10/31.

▲ **Tex., Corpus Christi**—City, City Hall, sanitary sewers $2,479,763; storm sewers, $328,900. CD 10/15.

▲ **Wis., Sheboygan**—City, City Hall, plans by W. C. Weeks, Inc., 718 Ontario Ave., garbage incinerator plant and garage shop bldg. $1,354,200. Estimated cost being revised. CD 9/21/55.

BRIDGES

▲ **NEW JERSEY and PENNSYLVANIA**—Delaware River Joint Toll Bridge Comn., Admin. Bldg., Morrisville, Pa., **Mercer and Bucks Counties**—bridge across Delaware River between Yardley, Pa. and Scudders Falls, N. J. $6,400,000. Michael J. Baker, Inc., Rochester, Pa., consult. engr.

▲ **N. Y., Buffalo**—City, City Hall, lift bridge to carry Ohio St. over Buffalo River. $4,500,000. CD 12/19.

▲ **OHIO**—State Dpt. Hys., State Dpt. Bldg., Columbus, Zone 15,
Franklin Co.—3rd St. Viaduct Columbus, $6,000,000. Alden E. Stilson & Assocs., 245 N. High St., Columbus, consult. engrs. CD 12/14, under O., Columbus.

▲ **O., Cleveland**—City, City Hall, Cleveland, Zone 14, $5,000,000 bond election Nov. 5 bridges. John Heffelfinger, city bridge engr. CD 11/5/54.

▲ **BRITISH COLUMBIA**—B. C. Govt., Parliament Bldgs., Victoria,
Kamloops—4-lane bridge to cross Thompson River linking Kamloops with North Kamloops $2,500,000. Phillips, Barratt & Partners, 1701 W. Broadway, Vancouver, consult. engrs.

▲ **Ont., Toronto**—Municipality of Metropolitan Toronto, 67 Adeleaide St. E., Tronto, subway at Lawrence Ave. W., east of Weston Rd., Weston, $1,750,000.

STREETS AND ROADS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston.
Holyoke—South Hadley-Highway relocation Rte. 202, $2,000,000. Whitman & Howard, 89 Broad St., Boston, Mass., consult. engrs. CD 10/10/56.

(Continued on page 122)

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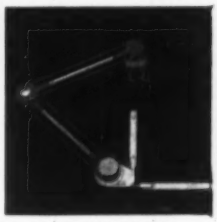

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(Continued from page 120)

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Braintree-Weymouth—Southeast Expressway exten., Union St. to Rte. 18, **$7,000,000**.
Brewster-Orleans—Mid-Cape Hy., easterly, **$2,000,000**.
Chelmsford-Lowell—relocate Rte. 110, from Rte. 4, $16,000,000. Bids early 1958. CD 8/11/55.
Chelmsford-Tyngsboro—completion Super Hy. through to New Hampshire Line, **$6,000,000**. Bids early 1958. CD 8/11/55.
Middleboro—Traffic Circle to Rte. 44, **$3,500,000**. Bids last of Sept. 1957.

▲ **MINNESOTA**—State Hy., Dpt., 1246 University Ave., St. Paul, Minn.,
Hennepin Co.—Interstate Rte. 394, conc. pavement 4.2 mi. four lines divided, from the Minnesota River in Bloomington to 78th St., **$739,200**.
Ramsey Co.—grading and conc. paving on Interstate Rte. 390, 1, 3.7 mi. four lane divided, on Mississippi St. from Hyacinth Ave., to Little Canada, and 11 bridges, **$2,664,000**.
1.1 mi. four lanes divided, on Mississippi St. from Mt. Airy Ave. to Jessamine St., and 6 bridges, **$792,000**.
Steel Co.—conc. pavement, 8.3 mi. four lanes divided, from Jct. TH14 at Owatonna to a point one mile north of the South Rice County line, Interstate Rte. 390, **$1,460,800**. Constr. within the next 12 months.

▲ **New York**—Pres. Bronx Borough, 851 Grand Concourse New York, Zone 51,
PX-29, paving grade separation at Fordham Rd. and Webster Ave., **$1,100,000**;
PX-30, paving grade separation at East Tremont Ave. and Webster Ave., **$750,000**;
PX-31, paving grade separation at Grand Concourse and E. 165 St., **$1,850,000**;
PX-40a, paving grade separation at Cedar Ave. and Sedgwick Ave., **$550,000**;
PX-40b, paving grade separation at Burnside Ave. and Sedgwick Ave., **$700,000**;
PX-40c, paving grade separation at Fordham Rd. and Sedgwick Ave., **$1,150,000**;
PX-40d, paving grade separation at Kingsbridge Rd and Sedgwick Ave., **$750,000**;
PX-40e, paving Sedgwick Ave., W. 169 St. to Fordham Rd. and Bailey Ave. to Mosholu Parkway, **$950,000**;
PX-65, paving grade separation at Grand Concourse and Van Cortlandt Ave., etc., **$1,000,000**. To go ahead after 1960.

▲ **N. Y., New York**—President Bronx Boro, 851 Grand Concourse, New York, Proj. PX-121, reconstr. Center roadway and walls of Grand Concourse between E. 138 St. and Mosholn Parkway. **$2,300,000**. To go ahead after 1962.

▲ **OHIO**—State Hy. Dpt., Columbus,
Butler Co.—imprv. State Rte. 128 from Tanglewood Lake north to and incl. Columbia Bridge, Hamilton, $1,500,000.

▲ **O., Cleveland**—City, City Hall, Cleveland, Zone 14, $6,000,000 bond election Nov. 5, freeways. Jay Katz, city engr. CD 11/9.

EARTHWORK, WATERWAYS

▲ **Mich., Detroit**—Port of Detroit Comn., Troy H. Browning chn., bond election Nov. 5, port development, Jefferson, Scotten, West Grand Blvd. and Detroit River, 12 acre site for bldgs. and 1200 ft. of berthing space, $3,000,000. Harley Ellington & Day Inc., 153 East Elizabeth St., Detroit 1, Mich., Engr.-archt. CD 9/7/44.

▲ **Washington**—Snohomish County Public Utility Distr., Everett, plans 140 ft. high and 240 ft. high dams, on Sultan River three 135,000 kw. powerhouses, 4.5 mi. tunnel and two 110-kv transmission lines, in Snohomish Co. R. W. Beck & Assocs., Tower Bldg., Seattle, Zone 1, Wash. Consult. Engr. will prepare application for FPC. **$41,100,000**. CD 5/12/49.

▲ **Wash., Seattle**—City, County-City Bldg., modernizing Cedar Falls hydro plant on Cedar River by replacement 3,400 ft. woodstave penstock with 78 in. welded steel penstock and by converting plant to automatic operation. **$1,560,000**. P. J. Raver, City Light Bldg., Zone 4, city light supt.

AIRPORTS

▲ **N. Y., Jackson Heights**—TERMINAL—Port of New York 111 Eighth Ave., New York 11, N. Y., 2-story 330,000 sq. ft. terminal with four 2-story arcades, **$15,300,000**. revising roadways, incl. constr. 1,100 ft. two level passenger road, **$8,300,000**; fill and paving boat basin, **$3,700,000**; landing facilities control tower, rebuilding runways 13-31 and 4-22 rebuilding east and west aprons and taxiways, addnl. taxiways and warm-up pads, **$1,400,000**. Total est. $32,000,-000. CD 1/14.

LATIN AMERICA

▲ **Mexico, Chihuahua**—City Govt., Palacio Municipal, Chihuahua City, waterworks, **$2,000,000**.

▲ **Mexico, Isla**—MILL—Roberto Mercado Dir. Conocido Jalapa, Vera Cruz, sugar mill **$4,000,000**.

PUBLIC BUILDINGS

▲ **Calif., Berkeley**—STUDENT UNION, etc.—Bd. Regents, University of Calif., Administration Bldg., plans by Vernon DeMars, 2161 Shattuck Ave., Berkeley, and Donal Hardison & Assocs., 160 Broadway, Richmond, 5 story student union bldg. and 3 story cafeteria, $4,-000,000. Constr. 1958. CD 12/27.

▲ **Calif., Davis**—AUDITORIUM, etc.—Bd. Regents, University of California, Administration Bldg., auditorium, plant pathology and bacteriology bldg., University of California, Davis Campus, **$4,500,000**.

▲ **Colo., Boulder**—DORMITORY—University of Colorado, Boulder, plans by Trautwein & Howard, 1411 Walnut St., Phila., Pa., new dormitory No. 8, **$3,200,000**. CD 2/21/56.

▲ **Conn., Orange**—SCHOOL—Town, Town Hall, plans by Davis, Cochran & Miller, 29 Whitney Ave., New Haven, elementary school. **$1,000,000**. CD 8/31.

▲ **Conn., Southbury**—BLDGS.—State P. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Frederick J. Dixon, Manor Lane, Easton, three 2 story, brick, central kitchen, each, buildings, Southbury Training School, **$2,000,000**. CD 1/24.

▲† **D. C., Wash.**—VETERANS HOSPITAL—Veterans Admin., Munitions Bldg., Zone 25, standard 500-bed hospital to replace Mt. Alto Hospital on Soldier's Home grounds rather than Montgomery County, Md. **$11,500,000**. Site changed. CD 5/16/56, under Md., Rockville.

▲ **Md., Baltimore**—BUILDINGS—Goucher College, Baltimore, 5 buildings incl., college center, chapel, student activities bldg., gymnasium wing and service center, **$5,000,000**. 1960 constr.

▲ **Mass., Monson**—HOSPITAL—Commonwealth of Mass., Dpt. Mental Health, 15 Ashburton Place, Boston, plans by Aisner & Atwood, 10 Newbury St., Boston, M-614, Hospital, State Hospital, **$1,000,000**. Constr. before 1958.

▲† **Mich., Battle Creek**—BUILDINGS—Veterans Admin., Munitions Bldg., Wash., D. C., plans by Harley, Ellington Day Inc., Detroit, Mich., additional buildings, utilities and alterations, and bldgs. 5, 30 & 85 addns., **$2,000,000**.

▲ **Mich., St. Joseph**—SCHOOL, etc.—Bd. Educ., St. Joseph, plans by Eberle M. Smith Assoc., Inc., 153 East Elizabeth St., Detroit, Zone 1, high school, incl. 140,000 sq. ft. swimming pool and gymnasium. **$3,-000,000**. CD 6/18.

▲ **Mo., Warrensburg**—BUILDINGS—State of Missouri, Jefferson City, plans by Preston Terrell, 1061 Baltimore Ave., Kansas City, Mo., practice teaching rooms and large gymnasium, State Teachers College, **$1,000,-000**.

▲ **Tex., Tyler**—SCHOOL—Tyler Independent School Dist., plans by Bruce-Russell, 530 S. Beckham St., Tyler, and Caudell, Rowlett & Scott, 425 S. Main St., Bryan, Senior High School, **$2,000,000**. Gregerson & Gaynor, 3010 Blackburn St., Dallas, Tex., consult. engrs. CD 11/23.

▲ **Tex., Tyler**—SCHOOLS—Tyler Independent School Dist. Plans by Bruce-Russell, 530 S. Beckham St., Tyler, and Caudell, Rowlett & Scott, 425 S. Main St., Bryan, Junior High School, **$1,375,000**; Elementary School No. 2, **$400,000**; Elementary School No. 1, **$350,000**. Gregerson & Gaynor, 3010 Blackburn St., Dallas, consult. engrs. CD 11/23.

▲ **Utah, Sandy**—SCHOOL—Jordan School Dist., Reed H. Beckstead, supt., 9361 S. State St., plans by Ashton Evans & Brazier, 24 SW Temple St., Salt Lake City, Jordan High School addn. **$2,000,000**.

▲ **Ont., Sarnia**—CITY-COUNTY—City, City Hall, 3 story 75,000 sq. ft., city and county bldg. **$1,500,-000**.

▲ **Ont., Toronto**—SCHOOLS—North York Bd. of Educ., 7 Kenneth St., Willowdale, Toronto, plans by Pentland & Baker, 490 Jarvis St., Toronto, Lindhurst Junior High School over **$500,000**; plans by Gordon S. Adamson & Assoc., 52 St. Clair Ave. E., Toronto, junior high school, Gorman Rd. west of Bathhurst St. north of Wilson Ave. **$1,200,000**.

COMMERCIAL BUILDINGS

▲ **Calif., Sacramento**—HOTEL-MOTEL, etc.—Hipp Realty Co., 2612 J St., agents, hotel-motel and 5 story professional bldg. 21st and T Sts. **$5,000,000**.

▲ **Calif., Sunnyvale**—HOME SUBDIVISION—Branden Constr. Co., P. O. Box 375, Hayward, 1500 home subdivision at Bayshore Hy. and Lawrence Station Rd. **$9,500,000**.

▲ **Colo., Denver**—OFFICE—777 Corporation, c/o Hamilton Management Corp., Speer Blvd. and Grant St., plans by T. J. Moore, 718 E. 6 Ave., office, E. 8 and Grant Sts. **$2,000,000**.

▲ **Conn., Middletown**—APARTMENT—Middletown Estates Inc., c/o Vincent J. Scamporino, atty., 148 College St., apartment bldgs., Newfield Heights. **$2,000,000**.

▲ **Conn., New Haven**—HOTEL, etc.—Roger L. Stevens, 745 Fifth Ave., New York, N. Y., plans by John Graham & Co., 444 Fifth Ave., New York, N. Y., 18 story hotel and commercial bldg., multiple store shopping structure and restaurant. **$18,000,000**.

▲ **Ga., Atlanta**—APARTMENT HOUSE—Clyde King, Jr., 1062 Lullwater Rd., apartment. **$2,000,000**.

▲ **Ill., Quincy**—HOSPITAL—St. Mary's Hospital, hospital. **$1,000,000**.

▲ **Ind., Indianapolis**—HOUSING—ABC Constr. Co., 5235 Winthrop Ave., 189 unit subdivision housing on 70 acre site, 30th and Franklin Rd. **$2,500,000**. CD 1/21/55.

▲ **Iowa, Waterloo**—HOSPITAL addn.—Schoitz Memorial Hospital, Waterloo, hospital addn. **$1,050,000**.

▲ **Mass., Swampscott**—HOTEL—Philip L. Ross, Atlantic Ave., Beach Bluff, Lynn, Hotel Preston, incl. 110

(Continued on page 125)

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(Continued from page 122)

rooms, swimming pool and health center, $1,000,000. Constr. 1958.

▲ **Mo., Kansas City**—SHOPPING CENTER—J. C. Nichols Co., 311 Ward Parkway, plans by Edward Tanner & Assoc., 311 Ward Parkway, Kansas City, white glazed brick with maroon trim, 40 unit shopping center, incl. split level, basementless, two service courts, and parking lot, $7,000,000. CD 4/10/52.

▲ **N. H., Concord**—BANK—Mechanics National Bank, 83 N. Main St., and New Hampshire Savings Bank, 97 N. Main St., plans by Bank Building & Equipment Co., 9 and Sidney Sts., St. Louis, Mo., bank, $1,000,000. Constr. 1958.

▲ **O., Canton** — OFFICE — Ferrell Constr. Co., 716 Figueroa St., plans by Ralph G. Dix Jr., 3307 Martindale St., 5 story 50,000 sq. ft. office, 14 and Market St. N. $1,000,000.

▲ **O., Eastlake**—SHOPPING CENTER—Angelo Marra & Lee G. Lehman, 643 Green Rd., Cleveland, Zone 21, shopping center, Lake Shore Blvd. $2,000,000.

▲ **O., Sylvania** — RESIDENTIAL — Crestview of Ohio Inc., c/o Victor Bjork, admin., Flower Hospital, Cherry St., Toledo, plans by Sanborn, Stekette & Assocs., J. V. H. Evans, archts.-engrs., 1214 Cherry St., Toledo. Crestview residential. Overall total est. $10,000,000. incl. 5-story 200-unit club apartments $2,500,000; 3 story, 100-bed nursing home, $1,000,000. Work to start within a year.

▲ **Okla., Sand Springs**—SHOPPING CENTER—Edward Cohen, 1944 E. 36 St., Sand Springs, plans by McCune & McCune, 1908 Utica Sq., shopping center. $1,000,000.

▲ **Pa., Bryn Mawr**—DORMITORY—Bryn Mawr College, Bryn Mawr, dormitory $750,000-$1,000,000. humanities bldg. $1,000,000.

▲ **Pa., Lewisburg**—HALL—Bucknell University, Lewisburg, Coleman Hall to house 8 departments and a little theatre. $1,500,000.

▲ **Tenn., Memphis**—HOSPITAL—Community General Hospital, Inc., c/o J. Frazer Smith & Assoc., archts., Goodwyn Institute Bldg., 8 story, 1190x400 ft., with 247,000 sq. ft. floor space, Eastgate General Hospital. $6,500,000.

▲ **Tenn., Nashville**—APARTMENTS, etc.—George Peabody College for Teachers, 21 Ave. S., four 2 story apartments for married students and a student center. $1,200,000.

▲ **Tex., Dallas**—OFFICE—Southern Baptist Convention c/o Relief & Annuity Bd., c/o Baptist Bldg., 15 story office $3,500,000. CD 4/19.

▲ **Tex., Houston**—HOSPITAL—Methodist Hospital, 6516 Bertner St., expanding existing hospital from 300-675 beds. $7,500,000. CD 9/12

▲ **Tex., Houston**—HOME FOR AGED—Texas Mehoodist Conference, c/o Methodist Hospital, 6516 Bertner St., Home for Aged. $1,000,000.

▲ **Que., Montreal**—HOUSING—Paul Rolland Constr. Ltee., 6745 Monkland Ave., plans by Georges E. Lemay, 6262 Briand St., housing program, new streets on north side of Beaconsfield Golf Club. $1,000,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Birmingham**—PLANT—Dewberry Engraving Co., 807 S. 20th St., plans by William Edw. Morris, Jr., Jackson Bldg., 2 story, air-conditioned sound proofed engraving plant, Clairmont Ave. and 31st St. S. $1,000,000.

▲ **Ill., Chicago**—GARAGE—Peerless Weighing & Vending Machine Co., c/o Friedman Alschuler & Sincere, archts., 223 W. Jackson Blvd., 8 story, 700 car parking garage, northeast corner Washington and Clark. $5,000,000.

▲ **N. J., Hopewell**—LABORATORY—Western Electric Co., 195 Broadway, New York, N. Y., engineering laboratory, 200 acre tract on Carter Rd. $1,500,000.

▲ **N. J., Mountain View**—FACTORY, etc.—Manhattan Shirt Co., 444 Madison Ave., New York, N. Y., 235,000 sq. ft. factory and warehouse on Hamburg Turnpike, Wayne Twp. on 24-acre former dairy farm. $2,500,000. Saniworth Hughes Co., 480 State Highway 17, Paramus, archt.-engr.

▲ **N. Y., Yorktown Heights**—RESEARCH CENTER, etc. International Business Machines Corp., 590 Madison Ave., New York, Zone 22, plans by Eero Saarmen, Bloomfield Hills, Mich., research laboratory and executive offices on 234 acre tract on Taconic State Parkway. $1,000,000. CD 9/28.

▲ **O., Cincinnati**—LABORATORY—Wm. S. Merrell Co., Amity Rd., plans by Wigton-Abbott Corp., 1225 South Ave., Plainfield, N. Y., 1 story, brick, steel organic chemical research laboratory, Amity Rd. $1,000,000.

▲ **Okla., Anadarko**—POWER PLANT—Western Electric Co-operative Assn., 302 W. Virginia Ave., Anadarko, 44,000 kw. Western Elettric Steam Plant addn. $11,000,000. Laramore & Douglass, 322 S. Michigan Ave., Chicago, Ill., consult. engrs. C. H. Guernsey & Co., 2701 N. Oklahoma St., Oklahoma City, Okla., engrs. CD 12/15/50.

▲ **Pa., Frazer**—MANUFACTURING, etc.—J. Bishop & Co., Malvern, plans by Gilbert Associates, Inc., 607 Washington St., Reading, consult. engr.-archt., manufacturing and office bldg. $2,000,000. CD 5/28.

▲ **Tex., Galveston**—PACKAGING CENTER—Falstaff Brewing Corp., 3312 Church St., Galveston, and 3617 Olive St., St. Louis, Mo., plans by O. W. Striegemeyer, No. 3 Sheraton Dr., St. Louis, Mo. and R. R. Rapp, 417 Stewart Bldg., Galveston, Tex., packaging center at owner's No. 8 plant and bottling plant addn. $1,250,000. CD 12/31.

▲ **Wash., Seattle**—MOTOR-FREIGHT TERMINAL—Freightways Terminal Co., c/o Consolidated Freightways, Inc., 2116 N.W. Savier, Portland, Ore., motor-freight terminal. $1,000,000.

▲ **Que., Montreal**—PLANT—Longueil Meat Exporting Co. Ltd., 2310 St. Georges St., Ville Lemoyne, plant, Laurier Blvd., Riviere Des Praires, $1,250,000. The Rankin Co. Ltd., 1610 Sherbrooke St. W., Montreal, consult. engr.

▲ **Que., Ste. Foye**—SUBSTATION—Quebec Power Co., 144 St. Joseph St., Quebec City, substation, $1,000,000.

UNCLASSIFIED

▲ **Calif., Los Angeles**—PARKS—City Parks & Recreation Dpt., imprv. Arroyo Seco Park; comfort station, picnic facilities, parking lot, and ground development, $150,000;
imprvs. in Banning Playground; water sys., play equipment, courts, lights, ground development, bldg. alterations and parking lots, $80,000;
imprvs. in Barnsdall Park; comfort station, bldg. alterations and parking lot, $127,000;
Bellevue Reservoir Playground, $110,000;
Beverly Playground, $180,000;
sports center at Boyle Heights, $742,000;
development of Buena Vista Reservoir Park, $100,000;
sports center at Daniels Field Club house, ground development, courts, lights, grandstand, comfort station, $92,500;
Del Rey Beach Development, landscape development, grounds development, comfort station, parking lot, concession bldg., water sys. $372,000;
development of El Paseo Cahuenga Park, $1,320,000;
Canoga Community Park, $300,000;
Chatsworth Community Park, $475,000;
general development of Chavez Ravine Park, $1,500,000;
playground clubhouse at Compton Playground, $215,000;
imprv. Compton Playground, ground development and parking lots, $180,000;
imprv. Eagle Rock Playground; landscape development, ground development, water sys., equipment, courts, lights, etc. $134,000;
imprvs. in Elysian Park, $160,500;
Granada Hills Community Park, $475,000;
Greek Theatre Imprv., $100,000; Hollingsworth water sys., $150,000; Bronson Canyon Water sys., $200,000; general parking lots, $70,000; comfort stations, $100,000; general water sys., $271,000; general ground development, $120,000; general landscape development, $200,000, all foregoing in Griffith Park;

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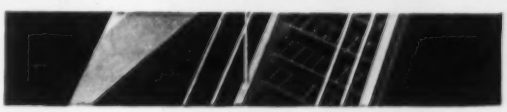

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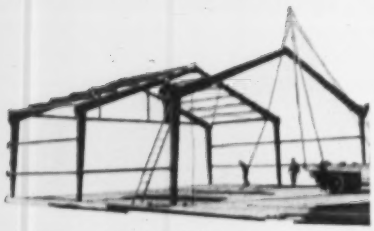

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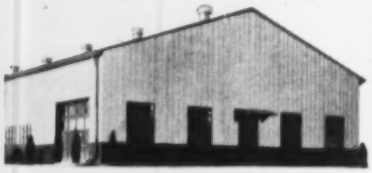

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comfort stations, $175,000; water sys. $120,000; ground development and sewer, $200,000; parking lots, $45,000; golf course and clubhouse, $500,000, all foregoing at Hansen Dam;
Harbor City Playground and park, $300,000; general development at Michads (Harbor Park) $200,000;
Hollenbeck Park imprvs., club house, ground development, water sys. parking lot, $239,000;
Honduras Playground, $75,000;
Lafayette Park Playground Clubhouse, $52,500;
playground clubhouse at Lemon Grove Playground, $125,000;
Nordhoff Community Park, $300,000;
development of North Beach, water sys., land development, parking lots, $105,000;
Northridge Community Park, $300,000; swimming pool bathhouse at Northridge Community Park, $230,000;
Orcutt Playground swimming pool and bathhouse, $230,000;
Palms Mar Vista Playground imprvs., incl. ground development, water sys. equipment, courts and lights, parking lots, $137,000; swimming pool and bathhouse, $230,000;
Panorama Playground Clubhouse, $125,000;
Paxton Sports Center, incl. swimming pool, club house, landscape development, play equipment, lights and courts, Pacoima, $400,000; swimming pool and bathhouse at Pecan Park, $158,000;
Peck Park imprvs., incl. ground development, water sys., comfort station, play equipment, lights, courts, etc., parking lots, storage facilities, San Pedro, $205,000;
Penmar Park general ground development, $50,000; 9-hole golf course, $280,000;
Prospect Park swimming pool and bathhouse, $127,000;
Rancho Cienega sports center, incl. ground development water sys., comfort station, parking lot, etc., $108,500;
Rancho Cienega Playground, swimming pool and bathhouse, $230,000;
Regional Park, Westchester Park, $100,000;
Rose Hill Park general development, $750,000;
swimming pool and bathhouse at Rustic Canyon Playground, $230,000;
San Pedro Community Park, San Pedro, $300,000;
Sepulveda Dam Recreation Area, Major Sports Field, $570,500; swimming pool and bathhouse, $230,000;
Sunland Playground clubhouse, $125,000;
Sylmar Community Park swimming pool and bathhouse, $230,000; Sylmar Community Park, $300,000;
Tarzana Community Park, $300,000;
Van Ness Playground swimming pool and bathhouse, $230,000;
Van Nuys Sherman Oaks Regional Park, landscaping, $50,000; water sys. $100,000;
Venice Beach Development, parking lots, guard stations, comfort stations, water sys., landscaping, $510,000;
swimming pool and bathhouse, $230,000;
Watts Playground expand and rehabilitate, $100,000;
Westchester Park, swimming pool and bathhouse, $230,000;
West Jefferson Playground, $250,000;
Westminster Playground, $50,000;
West Van Nuys Playground, $300,000;
Westwood Community Park, $660,000;
Winnetka Playground, $300,000;
Woodland Hills Community Park, swimming pool and bathhouse, $230,000; Woodland Hills Community Park, $300,000;
9-hole golf course and clubhouse, $150,000;
beach protection sys. $1,200,000;
3 dist. maintenance yards, $285,000;
costume maintenance and work shop, $150,000;
new zoological garden, $6,613,000;
modernization 60 comfort stations in various parks, $240,000; CD 6/12.

▲ Conn., New Haven—PARKING SPACES—New Haven Parking Authority, City Hall, off-street parking spaces for 3,200 vehicles, $7,500,000. William Bolton, city engr.

▲ Louisiana—GAS PIPE LINES—Southern Natural Gas Co., Watts Bldg., Birmingham, Ala., etxend 60 mi. gas lines to tie in South Nat. lines to fields in Plaquemines, St. Bernard and Jefferson Parishes $7,672,480.

▲ N. Y., Brooklyn—WHARF TERMINAL, etc.—Dpt. Marine & Aviation, Pier A, North River, New York, Zone 4, Proj. D-249, new wharf terminal, foot of Hamilton Ave., $3,500,000; Proj. D-251, new wharf terminal, foot of Fulton St., $2,500,000. To go ahead after 1962.

▲ O., Shaker Heights—SWIMMING POOL—City, 3400 Lee Rd., Shaker Heights, Zone 20, bond election Nov. 5, development of recreation center, incl. swimming pool. $1,000,000. CD 10/31.

▲ Texas—GAS LINES—Permian Basin Pipeline Co., (subsidiary Northern Natural Gas Co.) Midland, Tex., 83 mi. 16 in. gas line from Spraberry Station at Midland, to Pioneer Gathering Sys., Inc., in Schleicher Co., $1,660,000; 3,960 hp. compressor station, near Midland $350,000. CD 12/31.

▲ Texas—NIKE GUIDED MISSILE INSTALLATION, etc.—U. S. Army Defense Command, c/o U. S. 4th Army, Region 4, Fort Sam Houston, San Antonio, Tex., Nike Guided Missile installation and facilities, in Denton, $1,000,000-$1,500,000; in Alvarado, $1,000,000-$1,500,000; Mineral Wells, $1,000,000-$1,500,000; Terrell, $1,000,000-$1,500,000.

▲ Tex., Galveston—PIER—Todd Shipyards Corp., Pelican Dike, Galveston and c/o Industrial Rd., Houston, pier at Pelican Island, $1,000,000.

▲ Wis., Milwaukee—CONSERVATORY—Milwaukee Co. plans by D. L. Grieb, 316 E. Silver Spring Dr., conservatory in Mitchell Park. $1,000,000. CD 1/28/55.

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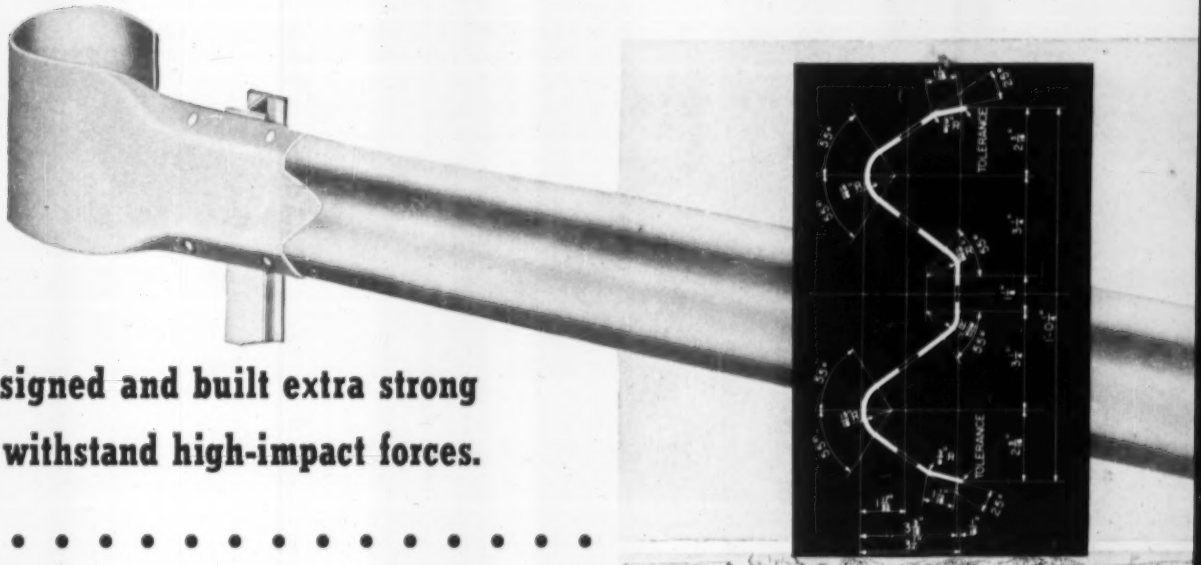

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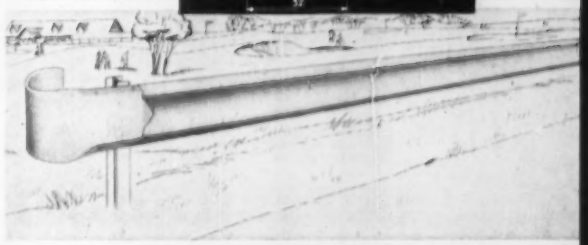

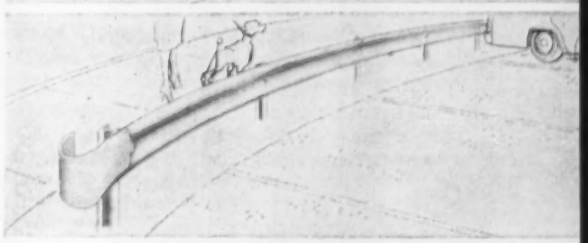

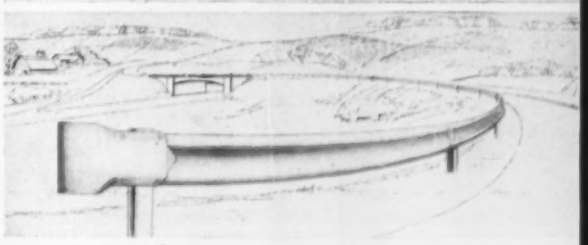

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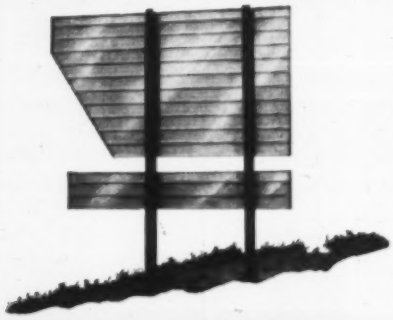

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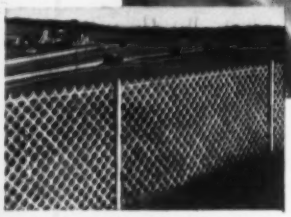

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HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 16, 30 Massachusetts

HEAVY CONSTRUCTION—LB & CA

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,
Consolidated Builders, Inc., Draper Ave. N., Attleboro, Mass., CA **$3,356,127**. Proj. 165-66, superstructure and deck for 12 span plate girder bridge over Connecticut River on Hartford-Springfield Expressway Proj. 165-66, East Windsor and Windsor Locks. Bids June 3. CD 6/5, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 16 New Jersey

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—Dpt. P. Wks., John W. Johnson, supt., Gov. Alfred E. Smith State Office Bldg., Albany, Bids opened 6/27,

N. Y.—**Theodore Zoli Constr. Co., Inc.**, Torrington, Conn., LB **$552,256** est. $582,000, reconstr. 3.33 mi. section Rte. 190 from Ellenburg to Ellenburg Center, incl. repairs and improvements to existing Chazy River bridge near Ellenburg, Clinton Co.;

N. Y.—**Torrington Constr. Co., Inc.**, Torrington, Conn., LB **$761,470** est. $830,000, b. conc. 1.08 mi. section Rte. 3 in and near Saranac Lake, starting near Lake Street and extending northeastward and eastward on new location in an arc north of present Rte. 3 to Main Street at River Street, incl. new three-span 186 ft. four-lane wide prestressed concrete beam bridge over Saranac River and new three-span 120 ft. long, five ft. wide prestressed concrete pedestrrian bridge over new Hy. near Leona Street, Franklin Co.;

N. Y.—**A.B.C. Paving Co., Inc.**, 178 W. Utica, Buffalo, N. Y., **$739,111**, resurf. 7.88 mi. Niagara Falls Blvd. (Rte. 18 and 62), in two sections, from Niagara Falls city line southeastward to North Tonawanda's north city line at Wurlitzer and from North Tonawanda east city line at Sawyer Creek southward to Rte. 356 intersection, Erie and Niagara Counties;

N. Y.—**William E. Bouley Co., Inc.**, Auburn, N. Y., LB **$1,052,203** (6 bidders) paving of previously graded 3.04 mi. four-lane divided section of Lake Ontario State Parkway and 1.16 mi. of various access roads and ramps, from Long Pond Rd. southeastward to Dewey Ave. which will incl. relocation of Island Cottage Rd., constr. of bridge to carry Island Cottage Rd. over Parkway and paving of Dewey Ave. traffic interchange, Monroe Co.;

N. Y.—**A. L. Baldes & Son, Inc.**, Hornell, N. Y., LB **$210,327** (2 bidders), wid'n. and resurf. 2.71 mi. section Rte. 36, starting at Rte. 21 intersection just north of North Hornell, and extending northward to Rte. 70 intersection in Arkport, Steuben Co.;

N. Y.—**Parlor City Constr. Co.**, Endwell, N. Y., LB **$477,894** (4 bidders), wid'n. and reconstr. 4.47 mi. section Rte. 13 and 34 starting at Ithaca's south city line and extending southwestward to point near Millard Hill Rd. just south of Newfield-Ithaca town line, Tompkins Co.;

N. Y.—**Utilities Contractors, Inc.**, Elmira, N. Y., LB **$98,091** (2 bidders), installation of traffic signal system along 2.8 mi. section Rte. 5 from Maynard Drive near Buffalo's city line eastward to Union Rd. at Williamsville village line, Erie Co.;

N. Y.—**H. L. Baughman, Inc.**, 1240 Jefferson, Rochester, N. Y., LB **$232,228** (6 bidders), wid'n. and resurf. two sections Rte. 47, 2.82 mi. southwest outskirts of Rochester, Monroe Co.;

N. Y.—**Hogeboom & Campfield, Inc.**, New Hartford, N. Y., LB **$527,830** (1 bidder), reconstr. Champlin Rd. starting at Campbell Ave. in Yorkville and extending 1.17 mi. southward to Burrstone Rd., Oneida Co.;

N. Y.—**Warren Bros. Roads Co.**, 309 Basin, Syracuse, N. Y., LB **$89,834** (5 bidders), resurf. 4.15 mi. section Rte. 3 starting at Jefferson-Oswego Co. line and extending northward, Jefferson Co.;

N. Y.—**Lancaster Development, Inc.**, Depew, N. Y., LB **$343,330** (7 bidders), wid'n. and resurf. three sections of existing blacktop westbound lanes on Rte. 20 between Sharon and Sloansville, 7.34 mi., Schoharie Co.;

N. Y.—**Henry J. Kearse**, 980 Westfield, Rochester, N. Y., LB **$162,507** (7 bidders), reconstr. 2.27 mi. section Rte. 252 south of Rochester, starting at Ballantyne Bridge over Genesee River and extending eastward to Rte. 15, Monroe Co.;

N. Y.—**Zara Contg. Co., Inc.**, Hicksville, N. Y., LB **$119,879** (7 bidders), resurf. 3.22 mi. section Rte. 107 (Cedar Swamp Rd.) starting in Old Brookville at Greenvale-Glen Cove Rd. and extending southeastward thru Upper Brookville and across North Hempstead Turnpike (Rte. 25A) to just south of Wheatley Rd. in Brookville, Nassau Co.;

N. Y.—Received no bids June 27, reconstr. 0.48 mi. section Rte. 28 and 30 in Margaretville, starting at Fair Street and extending northeastward and eastward along Main and Bridge Streets to Delaware River bridge, Delaware Co. CD 6/4.

BUILDINGS—LB & CA

▲ **Beekman Tower House**, 36 W. 44 St., Zone 19, New York, N. Y. Owner Builds. **$1,878,000**. 16 story APARTMENT, 1058-64 Third Ave., NEW YORK, N. Y. CD 2/1.

▲ **Mandel Bros. Contg. Corp. & Francis E. Freeman, Inc.**, 307 Fifth Ave., New York 16, N. Y., LB **$1,097,000** (5 bidders) house LAUNDRY and bath facilities and SHOE and TAILOR SHOPS, Elmira Reformatory, ELMIRA, N. Y. Bureau Contr. & Accts., Albany, N. Y. Bids June 27. CD 6/27.

▲ **Fred J. Brotherton, Inc.**, 185 Atlantic St., Hackensack, N. J., LB **$2,767,827** (32 bidders) general contract COURT HOUSE ANNEX, HACKENSACK, N. J. Bd. Freeholders Bergen Co., Hackensack, N. J. Bids June 26. CD 5/8;
Lafayette Iron Wks., 649 Grand St., Jersey City, N. J., LB **$513,000**, steel and iron (Hackensack, N. J.);
Fred Wendel, Sunflower Ave., Paramus, N. J., LB **$409,999**, heating and ventilating (Hackensack, N. J.);
A. Neri, Inc., 1034 Clinton Ave., Hoboken, N. J., LB **$499,000**, electrical work (Hackensack, N. J.).

▲ **Postal Constr. Co., Inc.**, 383 Pearl St., Brooklyn, N. Y., CA Est. **$1,200,000**, 1 story, brick, steel PLANT, Rte. 22, to be used as research laboratory, factory and office, WATCHUNG, (I. J. Stavid Eng. Co., U. S. Hy. 22, Watchung, N. J. S. Laurence Klein, 17 Academy St., Newark, N. J., archt.

▲ **Pub. School Bldg. Auth.**, 101 S. 25 St., Harrisburg, Pa., rejected bids opened May 16, SENIOR HIGH SCHOOL, JEANNETTE, PA. LB **$1,699,000**. CD 5/23, under LB.

▲† **H. L. Bright Co., Inc.**, 427 "O" St. S.W., Wash., D. C., CA **$1,138,000**, 70 family unit, Capehart HOUSING, FORT RITCHIE, MD. U. S. Eng., First and Douglas Sts. N.W., Wash. 25, D. C. Bids Feb. 28. CD 3/21, under LB.

▲ **Pikesville Home Builders, Inc.**, 514 St. Paul Pl., Baltimore 2, Md., CA **$1,190,000**. 170 HOUSES at Friendship Gardens, BALTIMORE, MD. Victor Posner Developments, 514 St. Paul Pl., Baltimore 2, Md.

▲† **Thomas Yoder Co., Inc.**, 7136 Wisconsin Ave., Bethesda 14, Md., CA **$1,748,000** (10 bidders) East Coast Relay Station, ENG-49-08-47-86-(84) & (87), FORT DETRICK, MD. U. S. Eng., 1st and Douglas Sts. N. W. Wash. 25, D. C. Bids June 26, awarded June 28.

▲† **Anthony P. Miller, Inc.**, 3333 Arctic Ave., Atlantic City, N. J. CA **$16,500,000**, armed services HOUSING, (Capehart), ENG-18-020-57-26, FORT GEORGE G. MEAD, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. Bids Feb. 19, CD 2/25 under LB, Commercial Bldgs.

▲ **Merando, Inc.**, 4098 Minnesota Ave. N. E., Wash. 19, D. C., LB **$1,075,492** (4 bidders) ANACOSTIA HIGH SCHOOL addn., 16 and R Sts. S. E., WASH., D. C. D. C. Govt., Dir. Bldgs. & Grounds, 499 Pa. N. Ave. N.W., Wash., D. C. Bids June 24. CD 5/27.

SOUTH

HEAVY CONSTRUCTION—LB & CA

▲ **FLORIDA**—State Rd. Dpt., Wilbur E. Jones, chn., Tallahassee, Bids opened 6/27,

Fla.—**Florida Asphalt Paving Co.**, Box 1013, Panama City, Fla., LB **$169,058** (2 bidders), light grading, 6 in. shell stab. base, etc. 2.185 mi. from (Job No. 4650-151, SR S-389A 30 at Sherman Ave. in Cedar Grove northeast to SR 389; Job No. 4651-155, SR-S-30A, Michigan Ave. in St. Andrews; Job No. 4664-152, West Bay School Rd. S.P. Bay Co.; LB **$74,552** (2 bidders), heavy grading, stab. base, surf. treat., etc. 0.464 mi. west of ST. Andrews Bay from Thomas Drive west, S.P., Job No. 4601-115, SR 30, Bay Co.;

Fla.—**Brooks Paving Co.**, 5607 N.W. 27th Ave., Miami 47, Fla., LB **$475,011** (7 bidders), 6½ in. limerock base, surf. treat. 6.512 mi. between Big Hickory Pass and SR 45 at Bonita Springs, incl. 160 ft. concrete deck span bridge on concrete pile bents, etc. S.P. Jobs Nos. 1260-150, 0361-150 & 1260-151, SR S-865, Lee and Collier Counties;

Fla.—**Coggin & Deermont**, Chipley, Fla., LB **$237,428** (4 bidders), 6½ sand-clay base, surf. treat. 7.136 mi. from Wrights Creek to SR 2, incl. widening existing 465 ft. concrete deck on timber pile bent bridge; small drainage structures, etc. S.P. Job No. 5250-101, SR S-177-A, Holmes Co.;

Fla.—**R. H. Strickland**, Quincy, Fla., LB **$238,156** (3 bidders), 8½ sand-clay base with b. conc. surf. course and binder, drainage structures, etc. 0.922 mi. from SR 20 in Bristol FA Proj. No. F-037-1(2) Job No. 5601-250 Liberty Co.;

Fla.—**Caddell & Jackson**, Box 2217, Jacksonville 3, Fla., LB **$114,045** (4 bidders), limerock stab. base; surf. treat., small drainage structures, etc. 4.106 mi. from SR 10 (US 90) to Ocean Pond; Job No. 2757-150, SR S-23-A, from SR 10 west of Macclenny north and east to SR 23; Job No. 2758-150, SR S-23-A, from SR 125 south of Glen St. Mary east to SR 23 S.P., Job No. 2751-153, SR S-231, Baker Co.;

Fla.—**White Constr. Co., Inc.**, Box 73, Chiefland, Fla., LB **$138,890** (4 bidders), 6 in. limerock stab. base, surf. treat. etc. 5.037 mi. Job No. 3052-150, SR S-340, from SR 349 (US 129) east to Rock Bluff Ferry; Job No. 3057-150, SR S-351-A from SR 351 to SR 349 S.P., Dixie Co.;

Fla.—**Jas. H. Craggs Constr. Co.**, Box 22, Gainesville, Fla., LB **$192,124** (2 bidders), 6½ in. limerock base surf. treatment, storm sewers etc. Roads and parking areas at University of Florida, S.P. Job No. 2649-128, Alachua Co.;

Fla.—**Noonan Constr. Co.**, Drawer 470, Pensacola, Fla., LB **$78,931** (4 bidders), 8 in. shell stab. base with bit. surf. treat, etc. 2.08 mi. on relocation of SR 85 within Eglin Air Force Base, west of Valparaiso FA Proj. No. D-RD-5(2) Job No. 5704-302, SR 85, Okaloosa Co.;

Fla.—**Langston Constr. Co., Inc.**, Box 3031, Orlando, Fla., LB **$79,360** (4 bidders), 6½ in. limerock base, surf. treat., etc. 1.437 mi. from Lake Tohopekaliga to SR 525, S.P. Job No. 9255-153, SR S-525 A, Osceola Co.;

Fla.—**W. M. Boozer Constr. Co.**, Marianna, Fla., LB **$204,335** (4 bidders), 6½ in. sand-clay base with bit. surf. treat, 6.196 mi. between Youngstown and Bennett also 120 ft. concrete slab bridge on timber piling, etc., FA Proj. No. S-58(2) Job No. 4664-250, SR S-388 Bay Co.;

Fla.—**Troup Bros., Inc.**, Box 168, Miami 33, Fla., LB **$178,793** (8 bidders), 6½ in. and 8½ in. limerock base, b. conc. surf. course; storm sewers 2.113 mi. in Fort Pierce on Oleander Blvd. and Sunrise Blvd. between Edwards Rd. and SR 5 (US 1) S.P. Job No. 9456-151, SR S-605, St. Lucie Co.;

Fla.—**J. D. Manly Constr. Co.**, Box 586, Leesburg, Fla. LB **$524,299** (8 bidders), 8½ in. limerock base; surf. treat, etc., from Cassia northeasterly approx. 8.56 mi. to point near Crows Bluff. S.P. Job No. 1111-107, SR 44 Lake Co.;

Fla.—**Brinson-Allen Constr. Co.**, Box 1455, Tampa 1, Fla., LB **$181,566** (3 bidders), limerock base wid'n strips and overbuild, plain cement concrete wid'n. strips, b. conc. surf. course with binder, etc. 0.746 mi. Colonial Drive from Mills St. to Bumby St. in Orlando, S.P. Job No. 7506-114, SR 50, Orange Co.;

Fla.—**W. L. Cobb Constr. Co.**, Box 977, Tampa, Fla., LB **$1,162,919** (6 bidders), 8½ in. limerock base, b. conc. surf. course with binder course storm sewers, etc., 4.44 mi. from east City limits of Apopka northwest to Plymouth S.P. Job No. 7502-105, SR 500, Orange Co.;

Fla.—**J. W. Conner & Sons, Inc.**, Box 2522, Tampa, Fla., LB **$73,380** (7 bidders), 6½ in. limerock base, b. conc. surf. course, etc., 0.889 mi. from west city limits of Fort Meade west. S.P. Job No. 1651-151, SR S-630, Polk Co. CD 6/17.

▲ **MISSISSIPPI**—State Hy. Dpt., T. C. Robbins, dir., Jackson,

Miss.—**Bowyer & Johnson Constr. Co.**, Crooks Bldg., Jackson, Tenn., CA **$107,942**, est. $115,000 base and double base surf. treatment 7.334 mi. Miss. Hy. No. 2 between Ripley and Kossuth Proj. No. S-0937(1), Alcorn Co.;

Miss.—**O. J. Stanton & Co.**, Greenwood, Miss., CA **$563,169** est. $530,000, 10.082 mi. grade, drain, 2 box bridges, 1 bridge on Miss. Hy. No. 27 between Georgetown and Crystal Springs Proj. F 054-1(1), Copiah Co.;

Miss.—**Pigford-Noblin Constr. Co.**, Meridian, Miss., CA **$879,351** est. $950,000, 10.167 mi. grade, drain, culverts, 2 box bridges and 4 bridges on US Hy. No. 49 between Brooklyn and Hattiesburg Proj. F-108-1(3), Forrest Co.;

Miss.—**M & W Constr. Co.**, Tupelo, Miss., CA **$156,945** est. $120,000, 4.223 mi. grade, drain and culverts on Miss. Hy. No. 23 between Tremont and Red Bay (Ala.) Proj. S-0806(6) A, Itawamba Co.;

Miss.—**John H. Moon & Sons**, Ridgeland, Miss., CA **$198,875** est. $140,000, 3.466 mi. grade, drain, culverts on Miss. Hy. 371 between Armory and Nettleton. Proj. S-0805(3)A, Monroe Co.;

Miss.—**J. B. Michael & Co. Inc.**, 1021 Heywood, Memphis, Tenn., CA **$2,081,212**, est. $1,820,000, 5.360 mi. grade, drain, culverts, 1 dual bridge, 2 dual hy. overpasses, base and D.B.S.T. US Hy. No. 51 in vicinity of McComb and Summit, Proj. I-091-1(6), Pike Co.;

Miss.—**S. K. Jones Constr. Co.**, Sterick Bldg., Memphis, Tenn., CA **$641,870**, 3.921 mi. grade, drain, culverts, bridges and grade separation structures on US Hy. No. 51 between Panola-Tate County line and Senatobia, Proj. I-091-4 (8), Tate Co. Grand total $4,629,364. Bids June 25. CD 6/18.

▲ **Henry C. Beck Co.**, 3259 S. Beckley St., Dallas Tex., LB **$1,503,521**, CONAC, Reserve-Facilities, Barksdale Air Force Base, ENG-03-050-57-48, SHREVEPORT, LA. U. S. Eng., 300 Broadway, Little Rock, Ark. CD 8/23.

MIDDLE WEST

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Dpt. Hys., Div. of Design & Constr., State Office Bldg., Columbus, Zone 15,
rejected bids June 11, c. conc. paving and continuous concrete slab bridge with concrete substructure over County Hy. No. 50, Br. No. POR-224-1172, grade separation with Pennsylvania RR consisting steel beam bridge with concrete deck and concrete substructure over Pennsylvania RR, Br No. POR-224-1190, Randolph and Atwater Twps., Portage Co. Est. **$1,121,000**; resurf. in part with b. conc. and grading, draining and paving in part with b. conc. on c. conc. 1.877 mi. City of Portsmouth, U.S.R. 52, Scioto Co. Est. **$513,800**.

▲ **OHIO**—State Dpt. Hys., Div. Design & Constr., State Office Bldg., Columbus, Zone 15,
George W. Lathrop & Sons, Inc., 1510 Montcalm Ave., Toledo, O. CA **$1,357,673**, est. $1,504,000. paving in part with c. conc. and paving in part with b. conc. 2.746 mi. U.S.R. 30N, Sections 9.56, 6.43, Van Buren, Madison, Delaware Twps., and Salem Twp., incl. continuous steel beam bridge with concrete deck and concrete sub-structure over U.S. Rte. No. 68. Br. No. HAN-30N-1197; a grade separation with

(Continued on page 131)

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- POSITIVE BALL BEARING SCREW FEED
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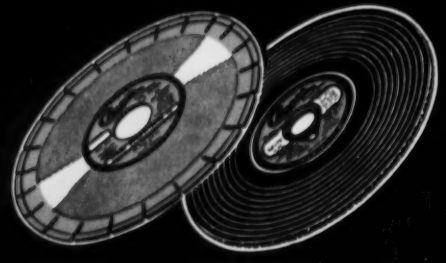

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(Continued from page 129)

New York Central RR consisting continuous steel beam bridge with concrete deck and concrete substructure, Br. No. HAN-30N-1220 over New York Central RR.; continuous concrete slab bridge with capped pile substructure, Br. No. HAN-30N-13322 over Flat Branch; concrete slab bridge with concrete substructure over Branch of Blanchard River, Br. No. HAN-30N-1457; concrete slab bridge with concrete substrtructure over Ripley Run, Br. No. HAN-30N-1605; continuous steel beam bridge with concrete deck and concrete substructure over Blanchard River, Br. No. HAN-30N-1703; concrete slab bridge with concrete substructure over Perkins Run, Br. No. WYA-30N-0654, Hancock and Wyandot Counties. Bids June 11. CD 6/21.

▲ **Cunningham Bros., Inc.**, 3591a Grand Ave., Beloit, Wis., CA $6,947,624. Contr. No. 7, Mill Creek Sewage Works, CINCINNATI, O. City, City Hall, Cincinnati, O. Bids June 4, awarded June 26. CD 6/7, under LB.

▲† **J. L. Simons, Inc.**, 12th floor, Inland Bldg., Indianapolis, Ind., CA $3,270,342, 214x219 ft. concrete block maintenance hangar and supplementary facilities at Bakalar Air Force Base, COLUMBUS, IND. U. S. Eng., 475 Merchandise Mart, Chicago 54, Ill. Bids June 18. CD 6/27.

BUILDINGS—LB & CA

▲ **H. W. Miller Constr. Co.**, 1511 Neave St., Covington, Ky., CA $2,229,000. Longview HOSPITAL addn., CINCINNATI, O. Ohio Dpt. P. Wks., 705 State Dpts. Bldg., Columbus, O. Bids May 28. CD 6/3, under LB.

▲ **C. D. Barnes Co.**, 3437 Eastern St. S.E., Grand Rapids, Mich., CA Est. $1,800,000. WAREHOUSE and SALES BLDG., GRAND RAPIDS, MICH. General Electric Appliance Co., George J. Essenburgh, distr. mgr., 305 Fulton St. W., Grand Rapids, Mich. CD 12/3/56.

▲ **Herman Gundlach Co.**, Houghton, Mich., CA $3,038,850, WADSWORTH HALL addn., Michigan College of Mining & Technology, HOUGHTON, MICH. State, A. N. Langius, dir., State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Ralph R. Calder, 1212 Kales Bldg., Detroit, Mich., archt. Bids May 28. CD 4/16/56.

▲ **Vivian & Sons Bldg. Co.**, c/o George H. Stieber, (owner), 4650 Chens St., Detroit, Mich., CA $3,200,000. 200 brick HOMES, Marion Anna Evelyn Van Dyke Sts., WARREN, MICH.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲ **Kan., Kansas City**—OFFICE, etc.—BA 7/17—Union Pacific Railroad Co., Rm. 1013 UP Bldg., Omaha 2, Neb., 21,570 sq. ft. 2 floors and penthouse office bldg., and 3,080 sq. ft. 2 floors block office bldg., and equipment garage, $8,000,000. Plans deposit $100, refundable. Leo A. Daly Co., 633 Insurance Bldg., Omaha, Neb., engr.

BUILDINGS—BA

▲ **Colo., Boulder**—CHEMISTRY—BA 8/6—University of Colorado Campus, Boulder, 3 story, bsmnt. L-shaped, 106,000 sq. ft. chemistry bldg. addn., $1,750,000. Huntington & Breisford, 370 W. 7th St., Denver, archts. Trautwein & Howard, 1411 Walnut St., Phila. 2, Pa., engrs. CD 8/8.

HEAVY CONSTRUCTION—LB & CA

▲ **TEXAS**—State Hy. Comn., Austin,

Tex.—**Allen Keller Co.**, Box 393, Fredricksburg, Tex., CA $576,172, flex. base, b. conc. pavt. and two courses surf. treat. 11.879 mi. Hy. US 183, Proj. F 223 (4), Burnet Co.;

Tex.—**Killian House Co.**, 4600 Broadway, San Antonio, Tex., CA $2,527,559, flex. base and hot mix b. conc. pavt. 4.262 mi. on Hy. Loop 13, Proj. I- 1075 (10), Bexar Co. Bids June 19. CD 6/14.

▲**TEXAS**—State Hy. Comn., Austin,

Tex.—**Worth Constr. Co.**, Box 531, Ft. Worth, Tex., CA $2,107,318, 8.133 mi. grad., structures, base, c. conc. pavt., b. conc. pavt. Hy. US 81, Proj. I. 139 (11), McLennan Co.;

Tex.—**Austin Bridge Co. & Ivan Dement**, P. O. Box 1590, Dallas, Tex., CA $1,124,413, flex. base, concrete pavt., b. conc. pavt., two course surf. treat. 7.936 mi. Hy. 2184 (1) & S. 2180 (1), Gray Co. Bids June 18, awarded June 27. CD 6/24.

▲ **COLORADO**—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Colo.—**C. L. Hubner Co.**, 4200 East Jewel, Denver, Colo. CA $2,249,140, bridges and sewer lines 0.937 mi. Valley Hy., between Santa Fe Dr. and Logan St. on State Hy. No. 185, Denver, Colo. Proj., City of Aurora, Denver Co.;

Colo.—**Thompson Pipe & Steel Co.**, 3001 Larimer, Denver, Colo., CA $1,800,000, 22 mi. 40 in. steel pipe, State Hy. No. 185, Denver, Colo. Proj. I-002-2 (47), City of Aurora, Denver Co. Bids 6/28. CD 6/19.

▲† **Wade Lahar Constr. Co.**, P. O. Box 2061, Colorado Springs, Colo., LB $1,667,212. non-portable supply mains, etc., for Air Force Academy, IFB-04-613-57-38, COLORADO SURINGS, COLO. Dpt. Air Force, P. O. Box 1670, Colorado Springs, Colo. Bids June 26. CD 6/6.

▲ **NEW MEXICO**—Office L. D. Wilson, ch. hy. engr., New Mexico State Hy. Bldg., Cerrillos Rd., Santa Fe,

N. M.—**Miller, Smith & Jones**, 500 Phoenix Ave. N.W., Albuquerque, N. M., CA $202,312, est. $219,469, raised median, curb and gutter, plant mix surf. course, drainage structures, median barrier fence and misc. constr. 9.26 mi. US 54-70 Alamogordo Urban and Alamogordo-Holloman Air Base, FAP Nos. F 018-1 (6) and F 020-1 (6), Otero Co.; CA $689,461, est. $708,471, 4-lane grading, base course hot plant mix, bit. surf., curb and gutter and misc. work 9.291 mi. N. M. 18 between Hobbs and Lovington, FAP No. F 026-1 (2), Lea Co.;

N. M.—**Armstrong & Armstrong**, 132 W. Walnut, Roswell, N. M., CA $1,834,739, est. $2,256,821, 4-lane, grade, drain, base course, hot mix bit. surf. 7.032 mi. US 60-85 approx. 7 mi. north of Socorro-northwardly also 2 major concrete box culverts, 2 continuous concrete slab bridges, 1 interchange with precast concrete girder bridge and misc. constr. FAP No. 1 091-3 (6), Socorro Co.;

N. M.—**Haake Constr. Co.**, Agua Fria, Santa Fe, N. M., CA $366,741, est. $415,934, 2-lane grading, base course, hot plant bit. surf. 2.749 mi. US 70 approx. 5.4 mi. east of Otero-Lincoln County line easterly; one bridge 163 ft. long and misc. work in connection therewith, FAP No. F 021-1 (2), Lincoln Co.;

N. M.—**Allison & Haney, Inc. & Daniels Constr. Co.**, 1412 Broadway N.E., Albuquerque, N. M., CA $1,110,088, est. $1,185,800, 4-lane, grading, base course, plant mix bit. surf. 5.822 mi. US 550 between Farmington and Aztec, incl. one multiple concrete box culvert, 2- 10 ft. x 10 ft. and misc. constr., FAP No. F 032-1 (5), San Juan Co.;

N. M.—**J. H. Marshall**, Clovis, N. M., CA $180,634, est. $215,241, two-lane, grading, base course, one course surf. treat. and misc. constr. 13.084 mi. N. M. 480 approx. 5 mi. southwest of Portales, FAP S 1255 (1), Roosevelt Co. Grand Total $4,384,772. Bids June 28. CD 6/21.

BUILDINGS—LB & CA

▲ **M. K. Eby Constr. Co.**, 610 N. Main St., Wichita, Kan., CA $4,354,580, general contract COURT HOUSE, WICHITA, KAN. Sedgewick Co., Court House, Wichita, Kan. Bids June 4. CD 6/21, under LB;

Ripstra-Turner Co., 1015 E. Douglas St., Wichita, Kan., CA $1,081,536, mechanical contract, for court house (Wichita, Kan.);

Brown Electric Co., 714 N. Main St., Wichita, Kan., CA $595,633, electrical contract for court house, (Wichita, Kan.).

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
July 24 California
STREETS AND ROADS
July 24, 25 California

HEAVY CONSTRUCTION—LB & CA

▲ **Guy F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif., LB $2,596,848 (5 bidders), constr. powerhouse, install turbine-generators at Swift Dam, Cowlitz, Co., WASHINGTON. Pacific power & Light Co., 920 S. W. 6th Ave., Portland, Ore.; E. Robert de Luccia, owner's engr. CD 10/21/53.

▲† **U. S. Eng.**, 4735 E. Marginal Way, Seattle 4, Wash., rejected bids May 10, constr. Eagle Gorge Dam on Green River, Kanasket, Inv. 57-44, WASHINGTON. LB $10,874,360. Will re-advertise. CD 5/15.

▲† **Green Constr. Co.**, 321 Locust St., Des Moines, Iowa, and **Tecon Corp.**, 1201 Main St., Dallas, Tex.; CA $20,572,366. dam and outlet works, Hills Creek Reservoir, Lane Co., CIVENG-35-026-57-175, OREGON. U. S. Eng., Pittock Block, Portland, Ore., bids May 28, CD 5/31, under LB.

BUILDINGS—LB & CA

▲ **Homes & Son Constr. Co.**, 1420 E. Bethany Home Rd., Phoenix, Ariz., CA $3,000,000. SHOPPING CENTER, 35th Ave. and Bethany Home Rd., PHOENIX, ARIZ. A. J. Bayless Co., 111 E. Henshaw St., Phoenix, Ariz.

▲ **James I. Barnes Constr. Co.**, 1940 Spring St., Redwood City, Calif., CA $5,265,300. 6 stories and ground floor, Type I constr. rein.-con. HOSPITAL, Cedar Ave., near Huntington, FRESNO, CALIF. Fresno County General Hospital, c/o Bd. Supervs., County Clerk, Courthouse, Fresno, Calif. Bids June 11, awarded June 27. CD 6/14, under LB.

▲ **Allis-Chalmers**, 650 Harrison St., San Francisco, Calif., CA $2,430,400, furnish, install SYNCHRONOUS GENERATORS, at Cherry Generating Sts., Tuolumne, SAN FRANCISCO, CALIF. City and San Francisco Co., P. Utilities Comn., c/o Secy., City Hall, San Francisco, Calif. Awarded June 20.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
July 17 Ontario
STREETS AND ROADS
July 17 Ontario

BUILDINGS—LB & CA

▲ **Oklahoma Pipe Line Constr.**, 6612 Harry Hines Blvd., Dallas, Tex., **Dutton-Williams Bros., Ltd.**, Northern Canadian Oil Bldg., Calgary, Alta., and **Gregoris Contractors, Ltd.**, 1211 W. 34th Ave., Calgary, Alta., (3 contractors) CA Est. $6,000,000. 344 mi. gas pipe line from Toronto-Monteal, ONTARIO-QUEBEC. Trans Canada Pipe Lines Ltd., 160 Bloor St. E., Toronto, Ont. J. L. Parrish Jr., c/o owner, ch. engr. Awarded June 26. CD 4/27/55.

(Proposal Advertisement see pp. 149 to 151)

FAST, LOW-COST WAY TO INSTALL PIPE . . .

push it under streets, roads, tracks, lawns with a timesaving

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Speed underground piping jobs this way. GREENLEE Pusher is one-man-operated (by hand or with power pump), portable, simple to set up and use. No tearing up of pavement, floors, lawns . . . does away with extensive ditching, tunneling, backfilling, repaving. GREENLEE Pusher cuts job time to a fraction . . . often pays for itself on first job.

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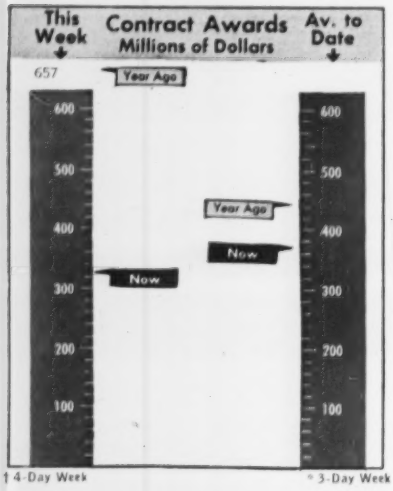
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week*	Cum. 28 wks 1957 millions	Chge '56-'57 %
Federal	$90.0	$1,567.9	+52
State and Municipal	124.4	3,952.8	+11
Total Public	214.4	5,520.7	+20
Total Private	111.1	4,733.9	−39
U. S. Total	$325.5*	$10,254.6	−17
By Type of Work			
Waterworks	$3.9	$207.4	+0.3
Sewerage	11.6	294.2	−11
Bridges	10.4	408.3	+19
Highways	64.2	1,635.7	+26
Earthwork, Waterways	25.8	645.0	+41
Buildings:			
Public, Excl. Housg.	75.7	1,240.8	+11
Public Housing	6.3	391.2	+95
Private Housing	49.4	1,664.4	−47
Commercial	45.2	963.0	−5
Industrial	11.2	1,845.2	−43
Unclassified	21.8	959.4	−6
U. S. Total	$325.5*	$10,254.6	−17

* 3-Day Week

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

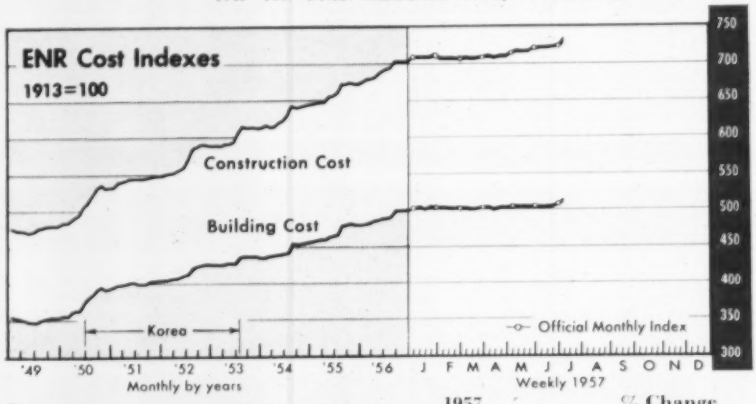
NEW CAPITAL FOR CONSTRUCTION

	Week of July 4	Cum. 27 wks 1957 millions	Chge '56-'57 %
Corporate Securities	$110.6	$3,262.8	+42
State and Municipal:			
All Except Housing	70.3	2,880.3	+10
Housing	...	155.8	+278
Federal Loans	27.5	144.1	+84
Federal Aid	120.0	2,085.0	+130
Total Nonfederal	$328.4	$8,528.0	+44
Federal Appropriations:			
In U. S.	$274.5	$305.1	−67
Outside U. S.	1.3	16.8	+30
Total New Capital	$604.1	$8,849.9	+29

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of July 4 1957	% Change from June 6 1957	% Change from July 5 1956
Construction Cost	733.80	+1.5	+5.6
Building Cost	514.02	+1.9	+5.0

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.850
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518



CONTRACTS AWARDED

	June 1957 (millions)	6-Mos. 1957 (millions)	% Change from 1956 June	% Change from 1956 6-Mos.
Total U. S., ENR reported	$1,561.4	$9,445.5	−4	−17
Private	730.2	4,412.5	−18	−39
Public	831.2	5,033.0	+15	+21
State and Municipal	685.8	3,651.1	+15	+12
Federal	145.4	1,381.9	+13	+54
ENR Volume Index, 1913=100	588	551	−8	−22

NEW CONSTRUCTION CAPITAL

Total U. S.	$2,747.6	$8,245.8	+33	+36
State and Municipal Bond Sales	457.4	2,965.8	−15	+15
Corporate Security Sales	513.7	3,152.2	+36	+40
Federal Loans, Aid (nonfederal work)	1,731.2	2,081.6	+88	+112
Federal Appropriations (federal work)	45.3*	46.2*	−80	−83

* Includes funds for outside U. S.

MATERIALS SHIPMENTS

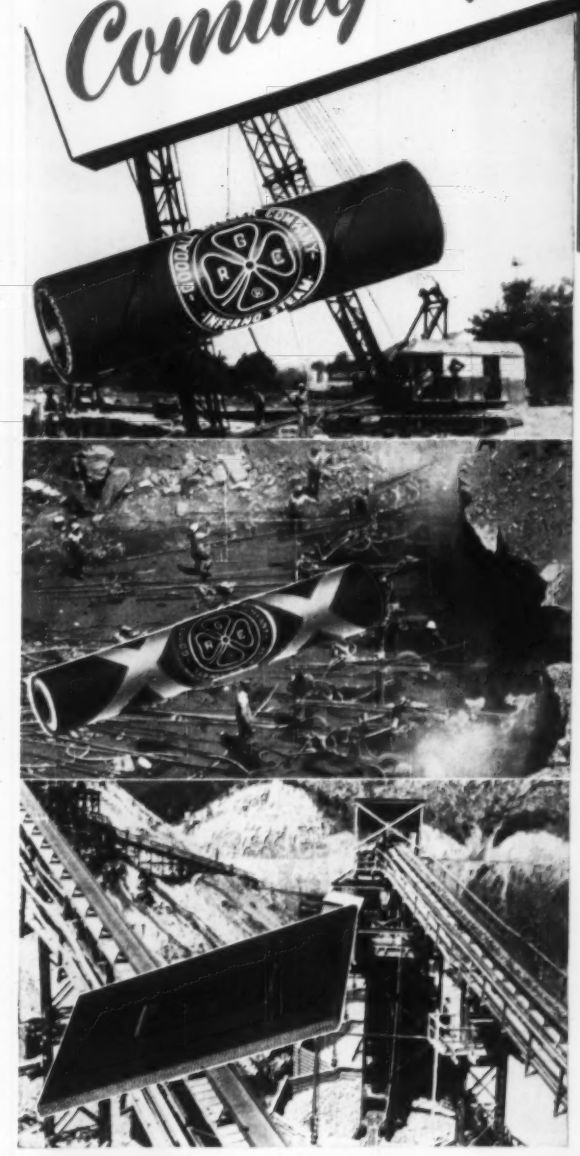
	Unit	1957 Mar. (M) April (A) May (My)	Cum. (No. of Mos.)	Percent Change from year ago Mo.	Cum.
Portland Cement, Bur Mines	thous bbls	20,551(M)	47,472(3)	−8	−8
Conc Paving Awards, PCA	thous sq yd	9,772(My)	41,562(5)	+15	+5
Fabricated Structural Steel					
Bookings, AISC	thous tons	292(My)	1,505(5)	−19	−18
Reinforcing Bars, Net, AISI	thous tons	216(A)	915(4)	−5	+14
Lumber, NLMA	mil fbm	3,023(A)	10,892(4)	−7	−12
Orders	mil fbm	3,043(A)	11,099(4)	−4	−12
Production	mil fbm	2,950(A)	11,089(4)	−6	−8
Douglas Fir Plywood, DFPA, 3/8" basis					
Production (average per week)	mil sq ft	109.6(My)	102.0(5)	+16	−4
Orders (average per week)	mil sq ft	110.0(My)	103.4(5)	+31	+12
Clay Products, Bureau of Census					
Brick, Unglazed, Common, Face	mil bri	454.6(M)	1,139.5(3)	−16	−20
Vitrified Clay Sewer Pipe	thous tons	133.3(M)	352.9(3)	−16	−19
Structural Tile, Unglazed	thous tons	52.0(M)	142.6(3)	−5	−11
Asphalt Products, Bureau of Census					
Asphalt Roofing	thous sales sqs	4,449(A)	15,829(4)	+16	−9
Asphalt Siding	thous sales sqs	80(A)	349(4)	+28	−6
Aluminum, Wrought, Net, Bur Census					
Sheet and Plate (non-heat treatable)	mil lbs	85.4(A)	316.3(4)	−14	−20
Wire and Cable	mil lbs	24.1(A)	96.1(4)	−15	−9
Extruded Shapes (soft alloys)	mil lbs	51.1(A)	194.5(4)	−6	−12

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS	thous	3,066(My)a	2,816(5)	+3	+6
Contractor Failures, Dun & Bradstreet					
Number		181(My)	915(5)	+37	+30
Liabilities	thous	$10,820(My)	$49,446(5)	+22	+27

(a) New series.

★ Big Jobs Coming Up?



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Cement Strike Decreases Stocks

Construction schedules disrupted in some cities as cement workers' strike closes one-third of U.S. mills

One-third of the nation's cement mills are idle because of a strike called by locals of the United Cement, Lime and Gypsum Workers International Union over a new wage pact.

Impact of the strike varies but in at least nine of the 20 major cities, construction schedules already have been disrupted or face an immediate threat.

Nine other major cities are not in trouble yet and in three, Seattle, Detroit and New Orleans sources reported that it is too early to determine the full effect of the strike.

Philadelphia was one of the first cities to be seriously affected. Stocks there had diminished almost to the vanishing point this week.

In five cities, New York, Baltimore, Kansas City, Mo., Chicago and Boston cement stocks are expected to carry the present rate of construction for a brief period—ranging from five days to two weeks.

Some cement work already is behind schedule in Cincinnati. Observers there say that a widespread construction shutdown could come within two weeks unless the cement strike is settled quickly.

Minneapolis contractors will have to scout around to find a supplier with cement. Some suppliers say they have enough cement to meet needs "indefinitely," others estimate that contractors will have to revamp their construction schedules within 30 days if the strike continues.

Many cities apparently are well stocked with cement. There's no alarm in such areas as Dallas, Cleveland, Birmingham, Atlanta, Los Angeles, Pittsburgh, San Francisco, St. Louis and Denver. A rash of large jobs entering the market unexpectedly could alter the situation quickly, however, in any of these cities.

The Atlanta situation is not quite as strong as some of the others. There's a feeling that a shortage could develop. But, one supplier told ENR, "If there is a shortage, it will be a brief one."

• **Strike is widespread**—Early this week, cement industry spokesmen estimated that more than 59 of the nation's 170 cement plants have been idled. Roughly one-third of the industry's capacity is affected.

Although some cement companies, such as Missouri Portland Cement Co., Huron Portland Cement, and Marquette Cement Manufacturing Co. have signed new contracts, most of the major firms are adamant in their refusal to settle for a "pattern" contract for the industry.

The position of the mills has been strengthened in the wage negotiations by the large stocks that were generally available at the time when the strike was called.

Two thorny questions have proven to be the major barriers to new labor contracts, according to industry sources. One is the union's drive for retroactivity; the other is an insistence that mills employ members of the union to install new machinery or do maintenance work.

• **Mills fight retroactive pay**—Industry sources stake their opposition to the proposal for retroactive pay not on the added cost to the employer, as might be expected, but on the grounds that such an agreement would give the union a weapon that could be wielded to prolong contract negotiations in the future.

If union members knew that any wage settlement reached after a protracted bargaining period would be applied retroactively, they would put less pressure on union leaders for a prompt settlement, according to industry sources.

• **Who does the work?**—The second barrier to an early settlement of the current strike is a controversial union demand that mills employ members of the union to install new machinery or perform maintenance and repair work in the existing plants. This is similar to demands made in recent years by the United Auto Workers, particularly at automobile plants.

If the cement workers' demand were granted, a mill could not use an outside contractor except for new construction.

Construction revenue falls short so . . .

Arkansas Faces Money Squeeze

Arkansas's highway and general building programs are being squeezed by a $1.4 million shortage—the amount by which tax income was underestimated.

Gov. Orval Faubus said that source has dropped far below expectations. Heavy rains and floods are blamed for the revenue drop.

The omnibus construction bill approved by the 1957 legislature contained two allotments—one for $5.6 million and another for $1.4 million. The first commitment can be financed immediately, but the second cannot.

• **Cut-off date**—During the legislative session, it was estimated that the increase in the sales tax would bring in sufficient money between Feb. 15 and July 1 to take care of all the commitments in the construction program.

With that belief, the legislature stipulated that after July 1, the extra income must be used to enlarge the operating budgets of the welfare and school departments. With this income now diverted, revenues available for construction are short of the original estimates.

The Highway Department also finds itself short of funds because:

• Gasoline tax revenues are short of estimates.

• A change from bond year to fiscal year financing.

Highway officials estimated that revenues, particularly those from gasoline taxes, would increase over last year by approximately 7.5%, but the increase is only 2.5%.

• **Financing change**—A change from bond year to fiscal year financing also will tend to keep the Highway Department's funds low.

The department had originally operated with a bond year that started in April. Debt service payments were taken out then with 70% of revenue going for debt.

When the legislature changed the bond year to correspond with the state's July 1 fiscal year, it also allotted $9.1 million for debt service, $3 million for refunds to counties and $750,000 for refunds of taxes paid on gasoline used in agricultural equipment.

The department therefore is left with only 30% for its operation or approximately $10 million. This amount, plus about $1 million monthly in federal aid, will pay for the $25 million in construction now under contract.

(*B&F continued on page 137*)

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During 1956, the national total of highway deaths was over 40,000—the highest figure in our history. The cost to the country of these wasted lives is incalculable.

But the picture wasn't entirely black. In many areas—in small towns and big cities—the terrible upward trend was reversed.

This was accomplished by community action—by business leaders, civic organizations, church, fraternal and PTA groups joining together with law enforcement agencies in an all-out attack on traffic deaths.

The figures prove it. Wherever people get together to do something about traffic safety, *deaths go down.*

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Cost Engineers to Set Estimating Standards

The American Association of Cost Engineers at its first annual convention on June 26-29 devoted two days to technical papers and the third to committee reports establishing this new association's objectives: to collect, correlate and disseminate construction and other cost data and to standardize terminology and methods. Out of a membership of 400, 161 members and many guests convened at the University of New Hampshire in Durham.

Present membership in AACE is predominently in the process industries, but about 17% is in contractor organizations, mainly companies working in the chemical, petro-chemical, petroleum, gas and related fields.

In addition to major concern with construction costs, these cost engineers are responsible for "profitability" and economic feasibility estimates.

Norman G. Bach (Monsanto Chemical Co.), President of AACE, pointed out that few if any cost engineers had had formal training in cost engineering, a serious lack in the engineering college curriculum, also that students are now coming out of colleges without training in costs. He set, as one AACE objective, work with colleges to introduce technical courses on costs and to set up student chapters of AACE.

The Estimating Standards Committee report by Chairman C. A. Miller (Canadian Industries, Ltd.) noted the difficulty of getting cost information from present accounting systems. To improve this situation attempts will be made to establish a close liaison with the American Institute of Accountants.

This standards committee has set up four subcommittees to standardize: 1—Terminology (James H. Black, U. S. Steel, reported for the chairman); 2—Estimating Methods (Jay M. Grey, Esso Research and Engineering Co., chairman); 3—Cost Records (Edmund F. O'Connell, Air Reduction Co., chairman); and 4—Profitability (Frank L. Frost, Jr., du Pont Co., chairman).

The estimating methods subcommittee gave this priority to the problems to be tackled: 1) labor estimating, 2) detecting and measuring accuracy of estimates, 3) materials, 4) establishing types of costs, 5) classifying and coding direct and indirect costs, 6) methods of correlating costs to plant capacities. The cost records subcommittee will be concerned with cost coding and accounting control. There was general agreement that coding be put on a decimal or numerical system readily adaptable to computers or punch cards.

Among the technical papers presented, "Process Piping Cost Estimating" by W. G. Clark, Dow Chemical Co., recommended estimating by number of connections as being more accurate than by lineal feet. A combination of the two gives even closer results. "Depreciation Effects on Payout Time in Project Desirability Appraisal" by B. J. Gaffney, Rust Engineering Co., compared straight line, sum-of-the digits, declining balances, discounted cash flow and sum of percentages methods of figuring depreciation and presented econographs showing the effect of fast writeoffs on profits.

In its first year the AACE has set up five regional sections—in the San Francisco Bay area, in Northeast Ohio, on the Gulf Coast, in the Mid Atlantic States and in Pittsburgh. The 1958 meeting will be held in Cleveland.

Founders of the Association are Professors O. T. Zimmerman and Irvin Lavine, University of New Hampshire, also of Industrial Research Service.

Tishman Plans Cleveland Skyscraper

This 21 story air-conditioned office building with an adjoining garage will be built by Tishman Realty & Construction Co., Inc., at Superior and East Ninth Streets in Cleveland later this year. Demolition of existing structures will start in September.

As designed by Emery Roth & Sons, architects of New York, the building will feature a facade of glass and aluminum. It will contain 300,000 sq ft of office space in addition to the store areas on the ground floor. The garage will park 550 cars.

New Hawaiian Law Calls For Contractor Licensing

Gov. Samuel W. King of Hawaii has signed a new law establishing a seven man board to license contractors.

The board will have the power to suspend or revoke licenses after a hearing. Contractors can appeal the board's decisions to the courts.

The governor has not yet appointed a board.

Licenses will be granted for various types of contracting work. The three principal categories will be engineering (or heavy construction), building construction and specialty contracting.

(B&F continued on page 138)

Construction Markets

San Francisco: An On-the-Spot Report

THE EMBARCADERO FREEWAY is one of San Francisco's largest current road projects.

Phenomenal growth rate of the San Francisco Bay Area—8,000 people a month for nine counties—is setting the pace for the construction industry.

Biggest need is for highways for the millions of automobiles kept on the roads by a travel-minded population. But the gasoline tax fund is healthy, with the result that the roadbuilding situation all over California is among the best in the nation.

Most noticeable change in the landscape of the Bay Area is the addition of a network of fast new freeways to link San Francisco to its bridges and to surrounding towns. The program, handled by the State Division of Highways, is well under way but destined to go on for a good many years.

One of the jobs in progress is the Embarcadero Freeway, which will skirt the city's waterfront and provide for a future extension south in the event that a connection with a southern bay crossing is required. Latest contract for a section of that freeway exceeded $7 million.

The legislature has approved a $35 million, four-year reconstruction program for the San Francisco-Oakland Bay Bridge, which will increase its capacity.

Both commercial and industrial building are at high levels, with many projects under construction and others scheduled for later this year. In the first five months of 1957, industrial building permits hit a figure of $1 million higher than for the same period last year, and the future looks good.

Building of electronics facilities is booming, but some plans have been deferred because of cost and peculiar industry problems.

Another headliner in the building picture is school construction.

Bay Area communities recently approved $34 million in school board financing.

San Francisco has $25 million worth of bond-financed schools in the offing.

Big public works projects are in sight—some ready to go and others caught up in political tangles.

If enough compromises can be reached, the face of the Civic Center will be changed by construction of a federal office building, state office building, and parking garage to serve the convention hall now being built. Action on the proposed $45 million federal courthouse and office building has slowed down temporarily, but bids are out for the $7 million, seven-story state building. Both the 400-stall underground garage in the Civic Center and a 1,000-stall downtown garage teeter on the verge of construction. A $19 million Hall of Justice is in the planning stage.

The city is in the second year of a five-year sewer construction program, with work now consisting mainly of intercepting sewers and system extensions to meet growth. No big new projects are on the horizon.

Redevelopment projects—also tied up by red tape and politics—nevertheless are inching along. Nearest to construction is Diamond Heights, where 60% of the 325 acres of land has been acquired and eminent domain proceedings have been instituted against remaining landowners.

Another project, which may be "pie-in-the-sky," involves construction of a new baseball stadium. No firm plans are afoot and the outcome may depend on whether Mayor George Christopher succeeds in getting a major league team (probably the New York Giants) to move to San Francisco.

Steel for construction is in good supply, with the possible exception of steel plate. Some relief is in sight in the form of light plate.

Architects and engineers are all busy, and the contracting business is good, although contractors always could use more work with a bigger profit margin. Optimism of contractors is reflected in the fact that they signed long-term labor agreements with all the major crafts.

Homebuilding is the fly in the ointment. It got off to a slow start with practically none of the normal spring upswing. Builders were hopeful that more mortgage money would be available by summer, but now aren't expecting relief before next year.

(*B&F continued on page 140*)

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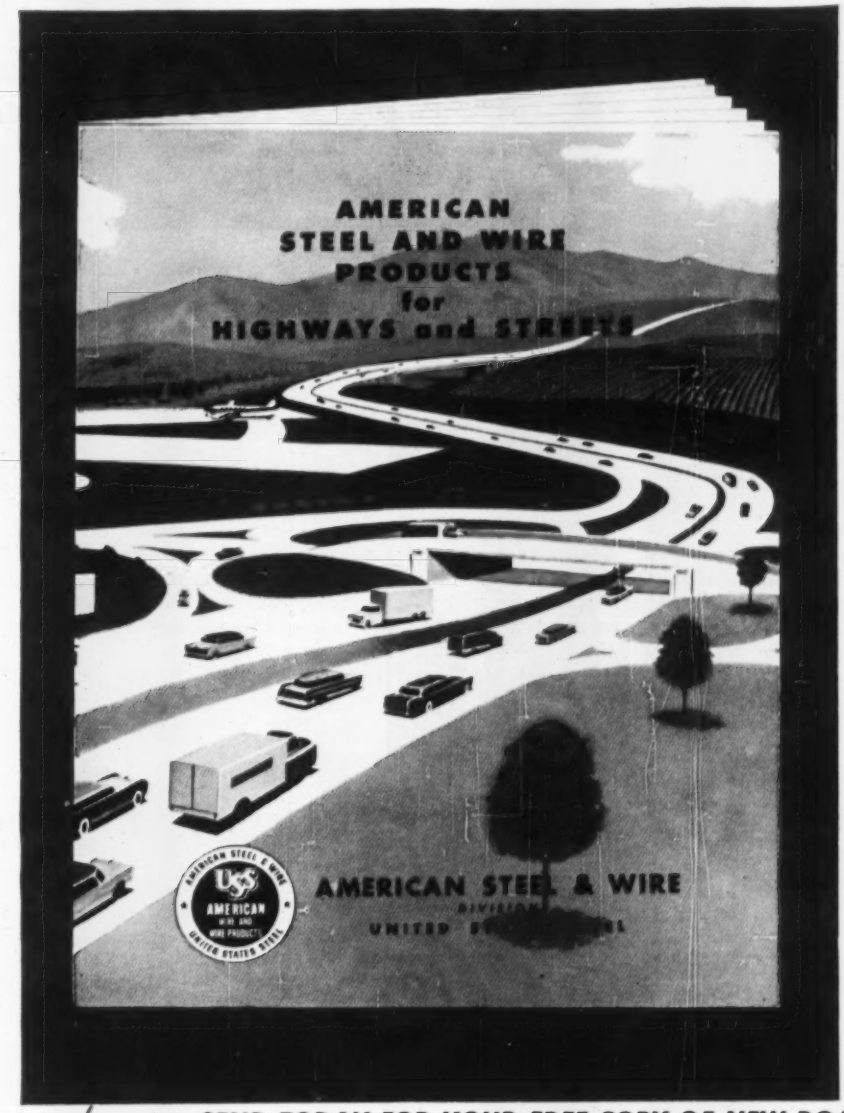

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UNITED STATES STEEL

Construction Bills Are Delayed in Delaware

Legislature adjourns until January without action on measures for schools, highways, state office buildings

The Delaware legislature has adjourned until January without completing action on major legislation affecting construction of schools, highways and new buildings for state agencies, even though both Republicans and Democrats had earlier tabbed such measures as "must" items.

Included in the list of programs still hanging fire are:

- A $45 million school construction program.
- A $22 million highway construction program.
- An omnibus bond program that would authorize the state to borrow $7.8 million for construction of a State Board of Health building and buildings at the University of Delaware and the Delaware State College.

Although the legislature has adjourned until Jan. 6, there is a good chance that it will be called back into session before then by Gov. J. Caleb Boggs.

During its recent session, which lasted nearly six months, the legislature provided for distribution of $1.2 million a year for the next two years to finance road work in incorporated communities; passed a measure requiring the state to pay public utilities for the expense of relocating their facilities on the state's share of the interstate highway system; and created an Air Pollution Authority.

• **Clean air**—Creation of the Air Pollution Authority is regarded as a significant step. The lawmakers gave the State Board of Health broad powers under the new act. The measure authorizes the establishment of an eight member Air Pollution Authority which will be administered by the State Board of Health.

Members of the authority will include the executive secretary of the Board of Health; the state sanitary engineer; the director of the Water Pollution Commission; a representative from the University of Delaware's agriculture department and another representative from the university's mechanical engineering division and three representatives from industry, to be named by the governor.

The authority will have the power to develop a program for control and prevention of air pollution; to issue orders to promote correction of air pollution problems; hold hearings; employ a staff; enter property "at reasonable times" to investigate conditions and enforce compliance with the laws they establish.

• **School bill in doubt**—The proposed $45 million school construction program, which would have been the largest in the state's history, now is in doubt. The Senate in the closing hours of the legislative session defeated by a close vote a bill that would have sharply reduced the size of the program—from $45 million to $5.2 million.

The Senate vote left the immediate future of the school building program undetermined. The Assembly has three alternatives: It can act upon a compromise program; it can revive the original bill for a $45 million program or it can pass the small $5.2 million bill that received support in the Senate.

• **Other action**—In other legislation, the lawmakers gave the State Highway Department full authority to build and repair facilities to protect beach areas from erosion; appropriated $1.2 million for maintenance of suburban streets; appropriated $800,000 for improvements at the University of Delaware and the Agricultural Experimental Substation; and voted funds for the State Soil Conservation Commission for purchase of heavy earthmoving equipment.

A bill for creation of a Water Resources Commission passed the Senate and is in the House Agriculture committee.

Turned down by the Delaware legislature: a bill providing for a state purchasing department and a so-called "right to work" measure.

Personnel:

Lehigh Graduates Start at $457 a Month

Civil engineering majors who were graduated from Lehigh University last month are starting their first jobs at salaries averaging $457 a month. According to Everett A. Teal, Director of Placement and Counseling Service at the university, the figure is an 11% increase over that of 1956 when the average salary was $413 monthly.

The report showed that of the 31 civil engineers covered in the study, three are starting work at salaries of more than $500 a month and eight are starting at more than $457 average.

In nine branches of engineering, the average starting salary for the Lehigh men is $465 a month. Electrical engineers took first place with an average monthly starting pay of $488. Engineering physicists are second with $481 to start and mechanical engineering majors are third with $465. Chemical engineers and metallurgical engineers rank fourth at $460 monthly.

• **All offers taken**—Mr. Teal said that none of the 31 civil engineers refused job offers in order to continue advance studies in graduate school.

The report also showed that 280 interviews were held on the Lehigh campus for civil engineers by personnel representatives from 78 companies.

In the over-all picture, members of the university's graduating class were sought by more employers and offered more jobs at starting salaries higher than one year ago.

Those graduated from the College of Arts and Science accepted average offers of $391 monthly as compared to $380 a year ago.

The top factor influencing job selection by the Lehigh seniors was the type of work, with 271 seniors listing this as most important. Location of employment placed second in job selection. Company reputation was third in importance. Pay was in seventh place.

• **Interview totals**—During the last seven months there were 5,663 interviews. Of that total, 415 accepted jobs with 199 companies.

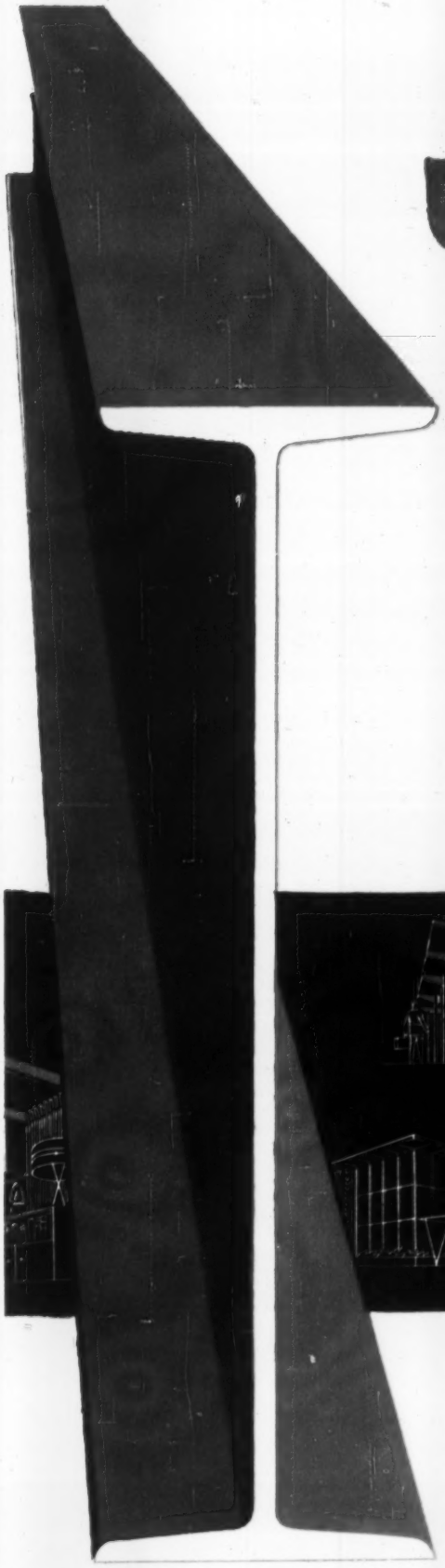
Only 57 seniors did not seek jobs, but instead chose to continue graduate studies.

So far, 400 companies have requested interviews with next year's seniors during November, December and January.

Mr. Teal said however, that the demand next year for graduates may not be as heavy as this year. Even so, the supply of seniors will not be sufficient to meet the reduced demand, according to Mr. Teal.

He also predicted that starting salaries may be raised about 5% with an average salary for engineers in the vicinity of $485.

(*B&F continued on page 142*)



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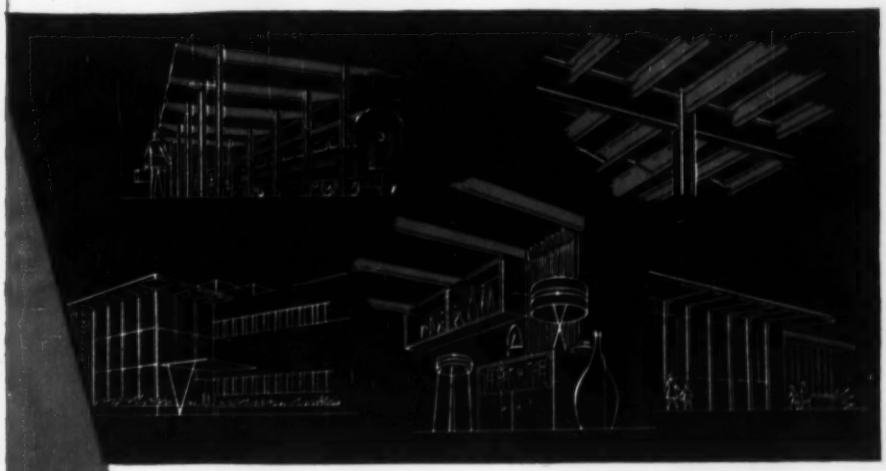

Junior Beam construction offers versatility for uses in residential and industrial construction, schools, hospitals, commercial buildings. Further information can be obtained by writing to the Jones & Laughlin Steel Corporation, Dept. 428, 3 Gateway Center, Pittsburgh 30, Pa.

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STEEL
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Hilton Hotel Planned for Pittsburgh

Bids will be called shortly for this 22 story $15 million hotel to be constructed for Hilton Hotels Corp. in Pittsburgh's Gateway Center. The 813 room building will be of cantilevered construction with metal and glass curtain walls. Start of construction is planned for September with completion scheduled for 1959. William B. Tabler of New York City is the architect with H. B. Callis as consultant.

Illinois Votes Money for Schools and Roads

Illinois' 70th General Assembly has been gaveled into history after providing large sums of money for future construction programs.

The state legislators approved a record-breaking $643 million highway construction program much of which represents the state's share of the interstate system.

The legislators also gave $227 million general state aid to schools and set up a $10 million revolving fund from which the neediest school districts can borrow for classroom construction.

And, the legislature also agreed to a referendum in 1958 for a $248 million bond issue that would be used to finance construction at state colleges and universities and at certain state mental institutions.

Gov. William G. Stratton's highway safety program also won legislative approval. This program included bills for a fixed speed limit, addition of 500 men to the state police force and a $10 million driver training program that will be financed with a $2 increase in the driver's license fee.

Largely because of the size of the construction programs, the legislature set a record by appropriating nearly $2.3 billion, substantially more than the governor had requested. The record budget won't require any general increase in taxes—but a "temporary" half cent increase in the state sales tax, imposed in 1955, was extended indefinitely.

Three important pieces of labor legislation were rejected by the Illinois lawmakers. They defeated bills to raise the minimum wage to 75 cents an hour and also turned down so-called "right to work" and "anti-picketing" legislation.

A Richer Detroit

Third industrial project is on city's drawing boards

A third big industrial redevelopment project taking in all of the old 50 acre Packard Motors property and 70 surrounding areas is on Detroit's drawing boards.

The multi-million-dollar proposal, aimed at expanding the city's industry, covers an area bounded by the Ford Expressway to the north, Mt. Elliott to the west, Warren to the south, and Canton to the east.

The plan is known as the "Hapter-Concord Project."

The project is being considered as a major extension to the midtown Milwaukee Junction redevelopment project.

• **A "revolving door"**—The timing of the two projects will permit firms dislocated by clearance of out-dated plants in the blighted area of Milwaukee Junction to build new facilities on adjacent land in the nearby Packard area.

Such a "revolving door" plan will also ease relocation problems for the 60 plants in the path of the Hastings-Oakland Expressway which is scheduled for construction late this year.

Estimates place the cost of land acquisition and clearing of a test site at $909,000. Detroit would recover about $839,000 of this amount through resale to private interests, leaving a net cost to the city of $70,000.

• **Total cost**—The total cost of acquiring and clearing the entire Packard property, including land and buildings, is estimated at $4.1 million, with the city recovering nearly $3 million from the sale of land and two buildings that are still usable.

Mayor Cobo of Detroit told Charles Blessing, Director of the City Plan Commission, to move ahead with plans for redeveloping an initial 35 acre tract in the southeast corner of the project area.

This portion of the project contains sufficient blighted housing to qualify for two-thirds federal aid with a net cost to the city of $476,000.

At least 10 firms in or near the project are reportedly interested in building new plants or acquiring new land for expansion and parking purposes.

Business Briefs . . .

• **Revised estimates**—San Diego, California's proposed new County Courthouse will cost $2 million more than the county can finance, according to revised estimates. Latest cost figure is $10.9 million as against an estimate of $7.7 million made a year ago. An $8.4 million bond issue for the project was approved in November 1954. County officials say plans will have to be revamped substantially to bring the cost in line with the funds available.

• **Tampa bond issue**—Tampa, Fla., will sell $6.2 million in bonds as the first step in a $20 million public improvement program. First bond sales will go for the construction of two bridges over the Hillborough River, a new police station and nine fire stations.

• **Fair grounds**—Gov. Goodwin J. Knight of California has signed legislation to provide $20 million for construction of a new State Fair plant.

USE HORNCURE CONCRETE CURING COMPOUNDS

for guaranteed specification compliance

For practically any concrete construction job, Horncure Concrete Curing Compounds will meet specification requirements.

* Horncure 30 is a 100% Resin Base Curing Compound which complies with the ASTM Specification C-309-53T Type 1.

* Paints or adhesives for asphalt, rubber or other types of resilient flooring may be applied over concrete cured with Horncure 30 after the proper surface preparation.

* Horncure 40 W is a Wax Resin Base Curing Compound guaranteed to comply with The Provisions of The Corps of Engineers, U. S. Army specification CRD-C-300-55. It also meets or exceeds most other specifications for white pigmented curing compound adopted by other Federal Agencies, States, Cities and Counties.

* Horncure 50 is a Wax Resin Base Curing Compound guaranteed to comply with the Department of the Navy Specification No. 13yd and NAV docks Typical Specification Jib, July 1945, Addendum No. 1, March 1951, plus American Association of State Highway Officials Specification AA-540-148.

* Horncure 60 is a Wax Resin Base Curing Compound guaranteed to meet specifications established by many municipalities.

A COMPLETE LINE. A. C. Horn Companies offer you one of the most complete lines of clear and white pigmented concrete curing compounds available. You'll find there's one (or more) that is most economical and effective for your application—whether interior or exterior, horizontal or vertical, above or below grade.

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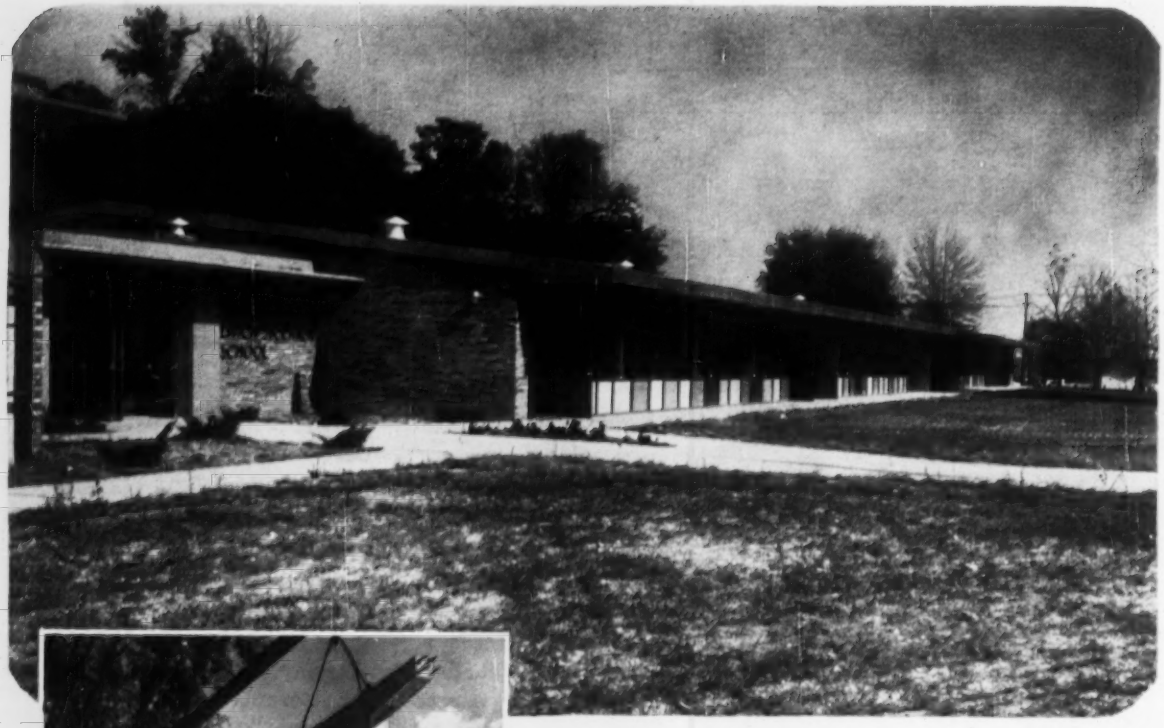
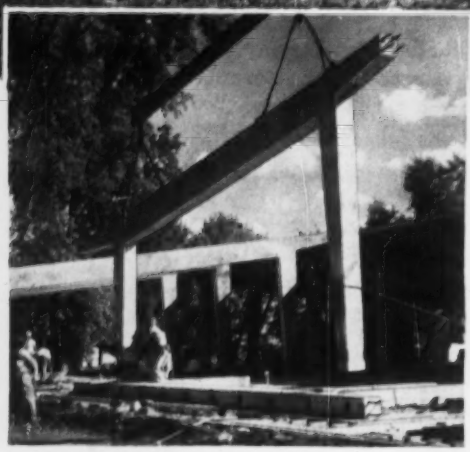
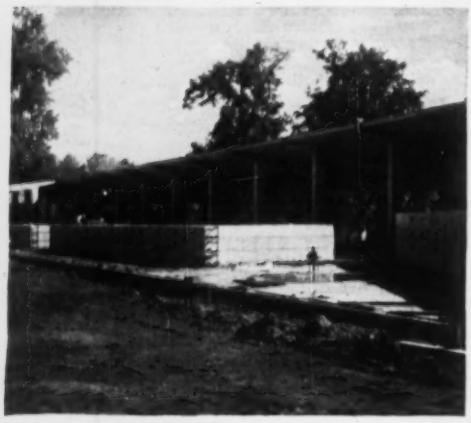




Large photo shows one wing of the Linton-Stockton School. Small photo above shows a close-up view of one of the precast concrete bents while photo below shows method of stockpiling concrete bents before erection. Designed by Thomas C. Dorste and Spiros G. Pantazi of Indianapolis. Structural engineer was Floyd E. Burroughs, also of Indianapolis.



Precast concrete members make low-cost school possible

The new Linton-Stockton Elementary School in Linton, Ind. has been widely acclaimed in educational circles. It is an example of the speed and economy with which urgently needed classrooms can be provided quickly and economically.

Saving in time and money resulted from the use of precast concrete construction. The frame is formed by precast concrete bents supporting precast channel slabs. Integral parts of the bents are arms for cantilevered sections. Both bents and roof slabs were precast on the site. Careful planning, standardization of members and utmost re-use of forms held down costs and construction time.

As a result the 80,000-sq. ft. school was built for $870,000. Its 36 classrooms, averaging 1200 sq. ft. in size, will accommodate 1,200 pupils. The restrooms and halls are floored with terrazzo, which was also used for wainscoating in the building.

Modern precast concrete schools such as this not only have low initial cost but also low maintenance cost, long life and low annual cost. And they're fire-safe, too! So make your next school precast concrete.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

New Jurisdictional Peace Plan

Building trades and industrial unions agree to use special task forces to handle inter-union disputes

Organized labor is about to attempt a brand-new system at solving the age-old jurisdictional disputes between the AFL-CIO's building trades and industrial unions.

It's the first time the rival union groups have come to terms on such a plan—and AFL-CIO President George Meany is hoping to rush it into action. At this point, nobody knows whether it will work. The significance is that both sides have agreed unanimously to try it out.

The agreement is the result of a series of meetings between officials of the Building Trades and Industrial Union Departments—a committee of the AFL-CIO Executive Council. It provides a step-by-step procedure for handling the heated fights that occur between the rival unions over construction rights in industrial plants.

One key factor, however, is that the plan contains no final step. If the dispute can't be settled by the spelled-out procedures, the agreement does not provide any final determination. The building trades, while willing to try the new system, still reject the idea of binding arbitration of such job fights.

• **The machinery**—This is the way the system will work:

• Six union officials—three each from the Building Trades and Industrial Union Departments—will form investigating teams. There will be three such teams of two members each which will look into the jurisdictional disputes on the scene. They will make suggested settlements.

• If this doesn't work, the disputes will be referred to a three-man headquarters group, composed of Richard J. Gray, President of the Building Trades Department; Walter Reuther, head of the Industrial Union Department, and a third person to be named by AFL-CIO President Meany.

• Failure of this three-man team to reach agreement will send the dispute to a special committee named by the AFL-CIO Executive Council.

Mr. Meany notes that "while this procedure does not provide for a definite terminal point, the consensus is that it can be used to settle a great many of the disputes and bring about an atmosphere by which it may be possible, at some time in the future, if desired, to provide a definite terminal arbitration."

• **The guide lines**—The investigating teams are to be guided by the basic jurisdictional yardsticks drawn up by the AFL-CIO's special jurisdictional committee. Essentially, they provide:

• The building trades unions are to get all new building construction.

• Industrial unions are to handle production and running maintenance work.

• The "no man's land" where the jurisdiction is not clearcut involves alterations, major repairs and relocation of existing facilities, changeovers and other types of maintenance work.

The key point in the disputed area is that the teams of investigators are to be guided by past practices on a plant, area or industry basis. Union officials believe that there have been enough settlements in this field to provide the basis for settling most such current and future disputes.

For instance, in the steel industry, the predominant system has been for the United Steelworkers to handle most construction in the steel plants. Union members are carried on steel payrolls to handle such construction jobs.

But, in the automobile industry, the system is usually the reverse, where the major auto producers contract out big construction projects.

• **Outlook**—This is not the end-all solution that the rival union groups have been seeking over the years. It does not bear the legal tightness of the AFL-CIO's No-Raiding Agreement. Rather, the plan is basically the first attempt to try and find the way out.

If this system doesn't work, it will soon be scrapped. Nobody is finally bound by it, since there is no final step to settlement. The idea is to see whether a backlog of jurisdictional cases can provide the basis for settling the new disputes.

As Mr. Meany puts it, "It will work if both sides know they can sometimes lose." But he sees it more as an initial step to solving jurisdictional problems, not the final solution.

Its chief significance lies in the guide lines that have been drawn up. Both sides have singled out their territory, and have agreed to what constitutes the middle territory. This is a far cry from 18 months ago, when the jurisdictional battles threatened to undermine the AFL-CIO merger.

But chances of complete success are slim. Take, for example, the running jurisdictional troubles between the sheetmetal workers and the steelworkers unions. This dispute has resulted in a craft union boycott of products manufactured by the steelworkers union, particularly involving the Burt Manufacturing Co. of Ohio. A special AFL-CIO committee headed by Mr. Meany has ruled on the issue, but Mr. Meany still has been unable to get the sheetmetal workers to comply.

• **Next step**—Next move in the new program is naming of the six-man team of investigators. These will be full-time officials on the AFL-CIO payroll, and Mr. Meany has urged Messrs. Gray and Reuther to make their selections soon.

Once they are selected, they'll be divided into two-man teams—one from each side—and stationed permanently in the East, Midwest and West. They'll be roving, on-the-spot investigators with power to recommend settlements.

Mr. Meany is also due to pick a third man for the second-step committee. He has given no indication, as yet, as to whom he has in mind. But many of the jurisdictional troubles reaching his desk have been taken on by his personal assistant, Peter McGavin.

Since the plan is a step forward and not an end in itself, it's not expected to speed up state mergers—as such—because it is not a final meeting of the minds between the two sides. It is however, a first step, with a working procedure that could lead—for the first time—to a diminishing and, perhaps, eventual end to jurisdictional fights.

Du Pont Hails Safety Mark —No Lost-Time Injuries

For the second time, a record of a full year without a lost-time injury has been set by Du Pont Construction Division men at all of Du Pont's 45 heavy building sites in 22 states.

Over 10,000 employees had chalked up 8 million exposure hours without a lost-time injury. Upwards of 240 major injuries could have been expected if the accident frequency rate had followed that of the construction industry.

This marks the second time that the company's construction activity has ended in a one year perfect safety record. In April 1955, over 9,000 employees completed a year without a lost-time injury.

(Labor continued on page 146)

Hot-Cargo Ban Valid

Court views enforcement as a contractual right

The validity of hot-cargo clauses and the right of union members to enforce them was upheld last month by the U. S. Circuit Court of Appeals for the Second Circuit.

In a case that may help to dispel the hot-cargo fog that has long troubled both contractors and the building trades, the court ruled that inclusion of a hot-cargo clause in a union contract does not violate public policy, is not prohibited by law, and gives union members a contractual right that they can enforce. The clause in question had been negotiated by members of the teamsters union.

Through a hot-cargo clause, members of a union reserve the right not to handle material that violates union policy or that comes from a company engaged in a labor dispute. Enforcement of the clause is generally called a secondary boycott and the question it places before the National Labor Relations Board and the courts is whether it constitutes an unfair labor practice, i.e. whether it is lawful or illegal.

The new federal court decision reversed a ruling of the NLRB, which takes the view that the clauses are not invalid but that efforts to enforce them are unlawful.

Following a new trend toward emphasis on contract law, the court said that "where the employees are encouraged only to exercise a valid contractual right to which the employer has agreed, there is no coercion." At the time the clause was agreed to, the court noted, the employer presumably received valid legal consideration for granting it and "he is no more coerced when the employees subsequently exercise their privileges than a land owner is coerced when those to whom he has granted licenses cross his land."

Union-Shop Agreements Now Illegal in Indiana

The right-to-work law passed by the Indiana legislature in March became effective last month, making Indiana the first major industrial state to ban union-shop agreements.

Under the law, labor contracts cannot require union membership as a condition of employment. Existing union-shop clauses are not affected, but they cannot be renegotiated or extended beyond their present expiration dates.

Similar laws are now on the books of 17 other states, mostly in the South, and have begun to appear at the municipal and county levels in California. Through the Taft-Hartley Act—Section 14 (b) which the building trades unions have sought to have repealed—the federal government has granted states permission to pass such laws, but it has not yet been legally determined whether that authority extends to political subdivisions of a state.

Protests New Reactor

Congress urged to halt construction in Michigan

Efforts by three AFL-CIO unions to block construction of a fast breeder nuclear reactor by Power Reactor Development Corp. at Lagoona Beach, Mich., were renewed last month. The protest is based on the contention that the reactor is a "laboratory" of a type whose safety has not been established.

Appearing before the Subcommittee on Legislation of the Joint Committee on Atomic Energy, Walter P. Reuther, President of the United Auto Workers, urged Congress "not to authorize one cent of federal funds" for construction of the reactor "until it has been tested and proven safe."

The reactor is presently under construction at a location midway between Detroit and Toledo—an area, which Mr. Reuther said, contains the "greatest concentration of industry and population in the United States." Construction was authorized by the Atomic Energy Commission last summer. On Sept. 1, 1956, the UAW, the International Union of Electrical Workers and the United Paperworkers instituted formal proceedings for revocation of the permit on the grounds that the AEC had violated its own rules, as well as the Atomic Energy Act, by issuing the permit in the face of a report by the Advisory Committee on Reactor Safeguards that there was no "assurance" that the PRDC reactor could be operated "at this site without public hazard."

The AEC has not concluded its consideration of the protest. According to Mr. Reuther, the hearings "drone on" and "the Atomic Energy Commission will probably wait until this session of Congress has adjourned and reaffirm their action taken last year. The only recourse the people of Detroit and Toledo have lies in this committee."

Mr. Reuther said the protesting unions favor "the fastest possible development of the peacetime uses of atomic energy consistent with the safety and health of the American people" and have "applauded" issuance of building permits where safety has been proven.

Beck Precedent May Apply to Hutcheson

AFL-CIO President George Meany last week indicated that he sees no room for double standards in the federation's policy of blacklisting union officials who invoke the Fifth Amendment. The showdown is scheduled for Aug. 12, when the Executive Council, meeting in Chicago, will consider the refusal by Maurice Hutcheson, general president of the carpenters union, to answer Congressional questions last month relating to alleged windfalls in the purchase of land by the State of Indiana for highway purposes (ENR June 20, p. 23).

Mr. Meany said he did "not see any distinction in the code" between situations involving purported misuse of union funds (the Beck case) and those concerning charges unrelated to union affairs. "I'm quite sure that question will be raised," he stated, "by the Hutcheson case."

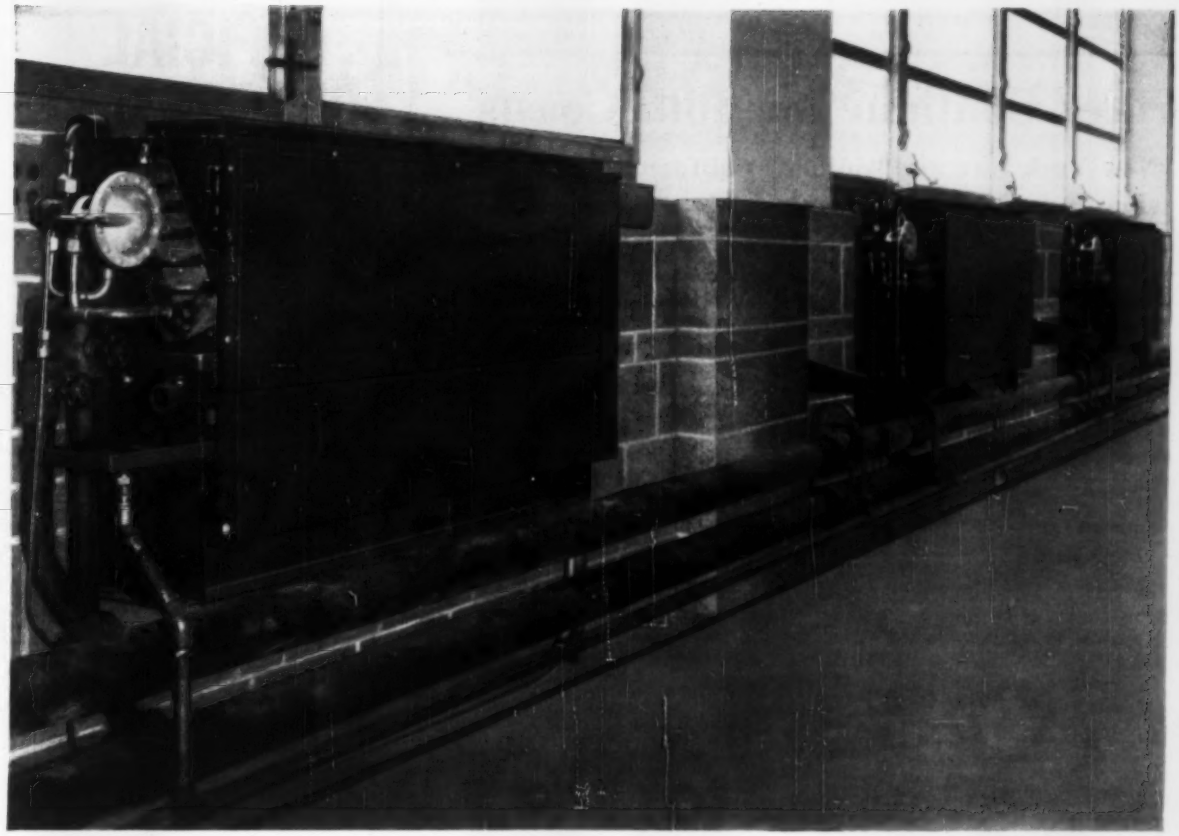
Adopted Jan. 28, the AFL-CIO policy statement declares "that if a trade union official decides to invoke the Fifth Amendment for his personal protection . . . he has no right to continue to hold office in his union."

Mr. Hutcheson holds AFL-CIO posts identical to those from which Mr. Beck was removed—vice president and Executive Council member. As a member of the council, he participated in the adoption of the Fifth Amendment policy and in Mr. Beck's removal.

Adding even greater depth to the Hutcheson problem confronting the AFL-CIO is the recent series of controversial decisions handed down by the U. S. Supreme Court on the sanctity of individual freedoms. Castigating Congressional investigators who ride rough shod over the constitutional rights of individuals, the court, in the Watkins case not only questioned the legality of the McClellan committee that precipitated Mr. Beck's demise as a union power, but warned against "broad-scale" intrusions into "the lives and affairs of private citizens" merely for "the sake of exposure."

Main source of the AFL-CIO dilemma is the distinction it has drawn between legal and trade union rights. While condemning union use of the Fifth Amendment, it has reaffirmed its "conviction that this historical right must not be abridged."

(*Labor continued on page 148*)



Armaflex is exceptionally flexible for easy application in hard-to-get-at places.

New insulation stops condensation on fluid cooling lines

Armstrong Armaflex®, a flexible foamed plastic insulation, completely seals out air and moisture. A low k-factor of .28 at 75° F. means that Armaflex in ½" thickness stops condensation on indoor cooling lines operating as low as 32° F. under normal design conditions. This thickness also will prevent condensation on small pipe sizes operating below 32°, within recommended temperature and humidity limits. On larger piping in the lower temperature ranges, double-layer application is recommended.

For domestic cold water lines operating above 50° F., Armaflex in ⅜" thickness may be used. On heating lines, this insulation will withstand temperatures as high as 200° F.

Armaflex is highly flexible for fast, easy application. It comes in 6' lengths, for pipes and tubing up to 3⅛" o.d.

Send for free booklet giving complete details on this new insulation. Armstrong Cork Company, 2107 Wallace Street, Lancaster, Pennsylvania.

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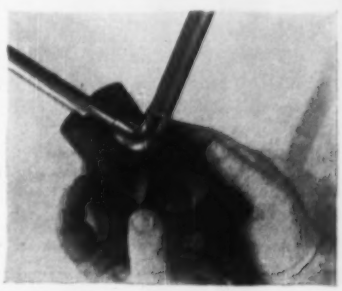
Easy to install, Armaflex can be slipped right over piping. A tale coating inside the covering speeds application. End joints are sealed with 520 Adhesive.



Fast fabrication of fitting covers for copper tubing or iron pipe is easy with miter-cut pieces of Armaflex.

Strikes Continue on Both Coasts

New York City and southern California projects are slowed down by strikes; some big wage gains noted

Construction projects on parts of both the East and West Coasts, already threatened by the effects of a strike in the cement industry, were slowed down by wage disputes last week. Three of the building trades were on strike in New York City, and over 25,000 construction workers employed by subcontractors were off their jobs in southern California. At the same time, new collective bargaining settlements gave members of one union a 66 cent hourly wage boost over the next three years, while another group won a $34 weekly increase over the same period.

• **California**—In Los Angeles and most other sections of southern California, the building industry, after successfully weathering negotiations with the basic trades, was hit July 1 by simultaneous strikes of 25,000 plumbers, sheetmetal workers and hod carriers against subcontractor groups. Wage demands ranged as high as 75 cents for a two year period.

Two lawsuits, meanwhile, were filed by employer groups. In an action against the plumbers union, the Plubing Heating and Piping Employers Council has asked for $5 million in damages and an injunction to prevent the union from striking to enforce alleged demands for putting supervisors under contract and for eliminating fabricating in contractors' shops. The Sheet Metal Contractors Council has sued 40 firms and 28 individuals in order to restrain them from signing with the sheetmetal workers on an individual basis.

Among the sub-crafts that have peacefully settled are electrical workers (a one year contract with a 30 cent package) and painters (a three year contract with a 66 cent package).

• **New York**—On Monday of this week, three New York City building trades with a total membership of 7,600—sheetmetal workers, steamfitters and ornamental iron workers—continued a strike into its second week after 11 of the 20 trades whose contracts expired June 30 had settled. Picket lines had not been established and as the week began estimates placed the amount of city construction affected by the strikes at 10%. Six trades—boilermakers, plumbers, asbestos workers, slate and tile roofers, stone cutters, riggers and machinery movers—were still at work without contracts.

Of the 11 trades with whom settlements have been reached, the six in the Cement Alliance agreed to a three year contract that grants an overall hourly wage boost of 75 cents payable in installments of 15, 10, 10, 10, 10 and 20 cents. Contracts with the other five include settlements for three years at 50 cents, two years at 60 cents and three years at 60 cents.

Main stumbling block in negotiations with the striking trades is the computation of fringe benefits—unions reportedly want benefits expressed in percentages, contractors in terms of a fixed number of cents per hour. Steamfitters also object to the size, number and sequence of installments in the Cement Alliance settlements, are asking for 1% increase in welfare, pension and vacation payments and are at odds with their contractors over the threading of pipe by hand versus machinery. Sheetmetal workers as asking for a two year instead of a three year contract and want an 88 cent package.

• **Colorado and Rhode Island**—Meanwhile, sheetmetal workers Local 9 in Denver has questioned the merits of a negotiated vacation plan. Although first of the Denver trades to have negotiated a vacation payment, they've now agreed to a new two year contract that lets the vacation issue hang fire—it may be dropped. Said one union official: "Some of the fellows think they want to handle the 7 cents themselves, they don't seem to want it set aside for them. Others like the idea—they make a little on interest and it's a good way to save." New contract grants a 10 cent wage boost next Jan. 1 and a 30 cent increase next July 1.

And in Rhode Island, union hoisting engineers on bridge, dock and pier jobs will receive a $34 weekly wage boost over the next three years, bringing their straight time wages to $184 a week. It's the biggest of the increases included in a new contract between operating engineers Local 57 and Associated General Contractors. Engineers in other categories will receive hourly wage boosts of 15, 20 and 20 cents during the three years, while firemen and oilers will receive their 15 cent boosts during the second and third years only.

OFFICIAL PROPOSALS

Bids: July 11, 1957

Walt Whitman Bridge
Contract No. 12

DELAWARE RIVER PORT AUTHORITY
of the
COMMONWEALTH OF PENNSYLVANIA
and the
STATE OF NEW JERSEY
Administration Building
Camden, New Jersey

Sealed bids will be received for FABRICATION and ERECTION of TWO BRONZE COMMEMORATIVE TABLETS for the WALT WHITMAN BRIDGE, known as Contract No. 12, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:30 P.M., Eastern Daylight Time, July 11, 1957, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken, within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $5,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialman's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the Work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
EXECUTIVE DIRECTOR

June 26, 1957

Bids: July 26, 1957

Construction of Sanitary Sewers

Sealed bids will be received until 11:00 A.M., EST, on July 26, 1957, in the office of the City Commission of Fort Lauderdale, Florida, for the construction of sanitary sewers in Area "D" consisting of approximately 54,000 linear feet of gravity sewers, 69,000 linear feet of air and force mains, 22 pneumatic ejector lift stations and appurtenances. This contract to be known as "Contract A", Improvement 1000.

Bidding blanks may be obtained from the office of the City Engineer. Plans, specifications, and contract documents are on file in the office of the City Engineer.

A deposit of $50.00 for plans and specifications, and of $35.00 for each additional set of plans or specifications, will be required. All deposits for plans and specifications will be refunded upon their return in good condition within 10 days of the opening of bids.

A certified check, cashier's check or bank officer's check, for 2% of the total amount of the bid, made payable to City of Fort Lauderdale, Florida, shall accompany each proposal as evidence of good faith and responsibility of the Bidder. This check shall be retained by the payee as liquidated damages should the Bidder refuse or fail to enter into a contract with the payee for the execution of the work embraced in the Proposal, in the event the Proposal of the Bidder is accepted.

The City Commission reserves the right to reject any or all bids.

William J. Veeder
City Manager

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.10 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.

SEND COPY TO: Official Proposal Division, Engineering News-Record, P.O. Box 12, New York 36, N. Y.

Bids: July 18, 1957

Cleaning and Painting Bridges

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M. D.S.T. on July 18, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 57-9 for Cleaning and Painting Bridges over the Erie Canal in Niagara and Erie Counties, New York. Engineer's Estimate for M 57-9 is $23,-200.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-9 may be examined and obtained at the offices of Mr. E. G. H. Youngmann, District Engineer, 65 Court St., Buffalo 2, New York.

The deposit for Plans and Proposal Forms for Contract M 57-9 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 57-9 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,300.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: August 2, 1957.

Pennsylvania Railroad Company

Strengthening, Widening and Reconstruction of Bridge

Sealed Proposals for the strengthening, widening and reconstruction of Overhead Bridge No. 59.39, carrying Washington Road over tracks at Sayreville, N. J. will be received by The Pennsylvania Railroad at the office of Assistant Chief Engineer-Construction, 1640 Transportation Center, Six Penn Center Plaza, Philadelphia 4, Pa., until 10:00 A. M., D. S. T., on August 2, 1957, at which time and place they will be publicly opened and read.

This project is being constructed under an Order of the Board of Public Utility Commissioners of New Jersey.

The contract documents, including plans and specifications, may be examined and obtained at the above-named office upon deposit of $10.00 per set, which will be refunded upon return of the Documents in good order within twenty days after date on which bids are received.

Each Proposal must be accompanied by a certified check of the Bidder, payable to The Pennsylvania Railroad Company in an amount not less than 5% of the total price stated in the Proposal.

Proposals must be submitted in a sealed envelope marked—Sayreville, N. J.—Overhead Bridge 59.39.

The right is reserved to reject any or all bids.

The Pennsylvania Railroad Company
J. F. Piper—
Assistant Chief Engineer-Construction

Bids: July 18, 1957

Cleaning and Painting Bridges

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A.M., D.S.T., on July 18, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 57-11 for Cleaning and Painting Twelve Bridges over the Erie Canal in Orleans County, New York. Engineer's Estimate for M 57-11 is $28,500.00.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, Gov. A. E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, New York.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-11 may be examined and obtained at the office of Mr. R. F. Perry, District Engineer, Barge Canal Terminal, Rochester, New York.

The deposit for Plans and Proposal Forms for Contract M 57-11 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 57-11 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $1,500.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and to the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: July 30, 1957.

CONTRACT BP-160.003

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
NEW PIER NO. 10 SUBSTRUCTURE
DEMOLITION—PIER 33

Sealed proposals for the demolition of the substructure of Pier 33, and dredging at and about the site of future Pier 10, all at the Brooklyn-Port Authority Piers, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, July 30, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, July 11, 1957

Bids: September 2, 1957

Government of Iraq Electrification of Basrah Power Project Contract No. (4) Boiler Feed Pumps and Auxiliary Service Pumps

The Development Board and Ministry of Development of the Government of Iraq invite tenders from qualified firms for the supply and delivery, of Boiler Feed Pumps and Auxiliary Service Pumps for Basrah Power Station.

Full information regarding this tender can be obtained on and after July 1, 1957 from Iraqi Embassy, Washington or Messrs. Ewbank and Partners, 10/11 Grosvenor place, London, S.W.1., England.

All Tender Documents are to be submitted in English to the Ministry of Development, on or before 12 noon, local time, on September 2, 1957.

Minister of Development

Bids: August 7, 1957

Moisant International Airport

Bids requested August 7 on five to six million dollar Moisant Airport Terminal Building, New Orleans. General Contractors may obtain two sets drawings and specifications from the office of the Architects, Goldstein, Parham & Labouisse and Herbert A. Benson - George J. Riehl, 811 American Bank Building, upon deposit of check for $200, which will be refunded upon return of documents.

Bids: July 23, 1957.

CONTRACT BP-160.002

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
PIER NO. 10
DEMOLITION OF PIER 33 SHED

Sealed proposals for the demolition and removal of the storage shed from Pier 33 at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, July 23, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, July 11, 1957

OFFICIAL PROPOSALS

Bids: July 18, 1957

Soil Explorations

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m. Advanced Eastern Standard Time, on July 18, 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATION AT VARIOUS SITES ON THROGS NECK EXPRESSWAY, INTERSTATE ROUTE 513, PROJECT I-111(2), BRONX COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. FA-SM-103.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York
(b) Mr. M. E. Goul, District Engineer, New York State Department of Public Works, 325 West Main Street, Babylon, New York
(c) Mr. William M. Trainer, Associate Contract Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50 percent of deposit. The Engineer's Estimate of cost for this work is $14,745.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. W. JOHNSON
SUPERINTENDENT OF PUBLIC WORKS

Bids: July 23, 1957.

Contract LT-160.063

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
NEW YORK APPROACHES
FLOODLIGHT TOWER REVISIONS
PLATE COVERS FOR BRIDGES

Sealed proposals for platform extensions and ladder safety railings and plate covers for bridges for floodlight towers at the New York Approaches at the Lincoln Tunnel, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, July 23, 1957, at which time said proposals will be opened and read in Room 1108.

Contract Documents may be seen at the office of the Engineer of Design of the Authority, Room 1115, and copies will be furnished upon request. No deposit will be required but the documents shall be returned in good condition not later than forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, July 11, 1957

Bids: August 2, 1957

Sault Ste. Marie Bridge Company Construction of Railroad Lift Bridge

Tenders are invited by the Sault Ste. Marie Bridge Company for the construction of a 370 foot railroad lift bridge over the south ship canal at Sault Ste. Marie, Michigan. Tenders must be delivered to the office of the Chief Engineer of the Soo Line Railroad Company, Minneapolis, Minnesota not later than 10 A.M., D.S.T., August 2, 1957.

Plans and specifications are on file for inspection at the Soo Line Office in Minneapolis and the Corps of Engineers Offices in Detroit and Sault Ste. Marie. Copies of plans and specifications will be furnished at a fee of $30.00.

OFFICIAL PROPOSALS

Bids: July 18th, 1957

Reconstructing and Repairing Champlain Canal

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Canal Law and Highway Law, sealed proposals will be received, until 10:30 A. M. DST on July 18, 1957 by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, the Governor Alfred E. Smith State Office Building, Albany, N. Y. for:

Contract M 57-8 for Reconstructing Tainter Gate Counterweights of Dam No. 1 and Repairing East Wall of Lock No. 1, Champlain Canal, Town of Half Moon, Saratoga County and Town of Schaghticoke, Rensselaer County, New York
Engineer's Estimate for M 57-8 is $91,-200.00

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 14th Floor, The Gov. Alfred E. Smith State Office Bldg., Albany, New York.
(b) Department of Public Works, 270 Broadway, New York City, N. Y.
(c) In addition to the above mentioned offices, plans, maps and specifications for Contract M 57-8 may be examined and obtained at the office of Mr. G. L. Nickerson, District Engineer, 343 Broadway, Albany 1, New York.

The deposit for Plans and Proposal Forms for Contract M 57-8 is $10.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Proposals for M 57-8 must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" in the amount of $5,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Canal Law and the Highway Law as set forth in "Instructions to Bidders" in the contract specifications.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: August 6, 1957.

CONTRACT BP-140.004

THE PORT OF NEW YORK AUTHORITY
BROOKLYN-PORT AUTHORITY PIERS
NEW PIER 2
DEMOLITION OF EXISTING PIER 8 AND CONSTRUCTION OF SUBSTRUCTURE AND DECK

Sealed proposals for the demolition of existing Pier 8 and the construction of the substructure and deck for new Pier 2 to be constructed at the Brooklyn-Port Authority Piers will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P. M. on Tuesday, August 6, 1957, at which time said proposals will be opened and read in Room 1108.

Contract documents may be seen at the office of the Engineer of Design of the Authority, Room 1115. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Donald V. Lowe, Chairman

New York, July 11, 1957

OFFICIAL PROPOSALS

Bids: July 30, 1957.

New Jersey Turnpike Authority

Contracts Nos. R-3A, R-3B, R-3C, R-3D, R-3E & R-3F

Proposals are invited for Contracts Nos. R-3A, R-3B, R-3C, R-3D, R-3E and R-3F which involve the construction of a maintenance building and outside facilities at Maintenance District 3, Crosswicks, on the New Jersey Turnpike in Burlington County, New Jersey, as follows:

Contract No. R-3A—General Construction
Contract No. R-3B—Structural Steel and Miscellaneous Metal Work
Contract No. R-3C—Plumbing and Drainage
Contract No. R-3D—Heating and Ventilating
Contract No. R-3E—Electrical Work
Contract No. R-3F—Grading and Paving

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11 o'clock Eastern Daylight Saving Time on the morning of July 30, 1957, at which time and place said proposals will be publicly opened and read.

Each bidder must submit with his proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours on or after July 10, 1957, at the office of the Authority. Contract documents will be furnished upon payment of Ten Dollars ($10.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Joseph Morecraft, Jr., Chairman

July 5, 1957

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4937) will be received at Oak View, California, until August 15, 1957, for furnishing labor and materials for Robles Diversion Dam and Robles-Casitas Diversion Canal, Ventura River Project, California. Location near Ventura, California. Principal items are 402,000 cu. yds. excavation; 12,200 cu. yds. concrete; furnishing and installing 7 radial gates; and other work. Completion time 575 days. For particulars, address Bureau of Reclamation, Post Office Box 97, Oak View, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: July 18, 1957.

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, Canal Law and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 18th day of July 1957, by Henry A. Cohen, Director, Bureau of Contracts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, G. L. Nickerson, District Engineer, 353 Broadway, Albany 1, N. Y.						
Albany	FASS 57-8	South Bethlehem-Feura Bush Co. Rds. 53, 54 and 102 Project S-483(1)	4.14	Asphalt Concrete	$25,000 Plans $15	$421,000
Albany & Saratoga (Rte. 9)	FARC 57-126	Louden-Crescent, Pt. 2, S.H. 5614; Clifton Park-Crescent, Pt. 2, S.H. 5639. Project F-639(10)	0.44	Asphalt Concrete=0.37 Mi.; Misc. Work=0.07 Mi.; Welded Plate Girder 5 Spans 1135'	$190,000 Plans $15	3,523,000
Saratoga	FASSRC 57-100	Charlton-County Line, FAS-SS 38-8; Charlton-Ballston Center, FASS 48-15. Project S-59(3)	8.38	Asphalt Concrete	$15,000 Plans $10	283,000
Saratoga	PSC 6627 PSC 7027	Railroad Relocation and Elimination of Various D. and H. R.R. Grade Crossings in the City and Vicinity of Saratoga Springs	19.87	New Tracks, Buildings & Misc. R.R. Work=11.61 Mi.; Cem. Conc. Pavt.=1.48 Mi.; Asp. Conc.=5.31 Mi.; R.O.B. Gravel Detours & Connections=1.47 Mi.; 10 R.R. Sep. Structures & 1 Box Bridge	$400,000 Plans $100	7,055,000
Saratoga (Rte. 9P)	RC 57-123	Malta-Bemis Heights, Pt. 1, S.H. 1528	0.17	Asphalt Concrete	$2,500 Plans $10	43,000
DISTRICT No. 3, Wm. Robinson, District Engineer, Weigh Lock Building, 301 E. Water St., Syracuse, N. Y.						
Oswego (Rte. 57)	FARC 57-125	Fulton-Oswego, S.H. 5382 Project F-U-583(5)	7.20	9" Cem. Conc. Pavt. 24'-48' Wide Precast Concrete Slab Br. 36'	$95,000 Plans $15	1,750,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, N. Y.						
Genesee (Rte. 19)	FARC 57-101	Le Roy-Brockport, Pt. 3, S.H. 1730 Project S-451(1)	2.88	Asphalt Concrete	$11,000 Plans $10	200,000
Livingston (Rtes. 5 & 20)	FARC 57-102	Avon-Lima, S.H. 5302 Project F-343(13)	2.67	Asphalt Concrete	$8,000 Plans $10	142,000
Monroe (Rte. 19)	FARC 57-104	Hamlin, Pt. 1, (Brockport-Hamlin), S.H. 80; Hamlin, Pt. 2, (Hamlin-N. Hamlin), S.H. 81. Project S-509(1)	4.21	Asphalt Concrete	$16,000 Plans $10	293,000
Wyoming (Rte. 20A)	FARC 57-105	Varysburg-Warsaw, Pt. 2, S.H. 1349A Project F-767(2)	1.67	Asphalt Concrete	$5,500 Plans $10	106,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court St., Buffalo 2, N. Y.						
Chautauqua (Rte. 60)	FARC 57-106	Sinclairville-Casadaga, Pt. 2, S.H. 1012-1012A Casadaga-Fredonia, S.H. 938 Project F-1117(1)	6.27 (1.83 Acc.)	Asphalt Concrete=6.49 Mi.; 9" Cem. Conc. Pavt. 24' Wide=1.24 Mi.; Misc. Work=0.37 Mi.; Reinf. Conc. Arch Br. 68'	$122,000 Plans $25	2,206,000
Erie	FINTC 57-2	New York State Thruway—Niagara Section—Subs. N3 and N4 (Louisiana St. to Washington St.) Project I-865(15)	0.77	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide=0.72 Mi.; Misc. Work=0.05 Mi.; 39 Span Comp. Beam Viaduct 2670'; 65 Reinf. Conc. Piers for Ramps	$600,000 Plans $100	10,007,000
Niagara	M 57-7	Bridge E-222 Over Erie Canal at Gasport		Reconstructing Control Cabin	$800 Plans $10	14,000
DISTRICT No. 7, R. W. Sweet, District Engineer, 444 Van Duzee Street, Watertown, N. Y.						
Clinton & St. Lawrence	RC 57-108	Br. No. 1, S.H. 476; Br. No. 1, S.H. 5311; Br. No. 2, S.H. 777; Br. No. 2 and Br. No. 3, S.H. 1548; Br. No. 1, S.H. 1263; Br. No. 1, S.H. 8241 and Br. No. 2, S.H. 8199		Cleaning and Painting 8 Bridges	$1,300 Plans $10	23,000
St. Lawrence (Rte. 37A)	FARC 57-107	Ogdensburg-Waddington, S.H. 9357 Project F-650(6)	13.62	Asphalt Concrete, Ty. 1A	$23,000 Plans $10	430,000
DISTRICT No. 8, K. G. Rauer, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia (Rte. 9)	FARC 57-109	Hudson-Stockport, S.H. 341 Project F-368(10)	2.47	Asphalt Concrete	$6,000 Plans $10	106,000
Columbia (Rte. 9)	FARC 57-110	Blue Stores-Livingston, S.H. 5004 Project F-322(14)	2.59	Asphalt Concrete	$7,000 Plans $10	134,000
Dutchess	FESS 57-9	Old Route 22: County Road No. 81 Project ER-67(1)	0.13	Repair Exist. 65.1' Bridge	$1,000 Plans $10	19,000
Dutchess (Rte. 22)	FARC 57-111	Millerton-County Line, S.H. 709 Project F-350(22)	1.39	Asphalt Concrete	$2,500 Plans $10	48,000
Dutchess (Rte. 9)	FARC 57-112	State Hospital, S.H. 9003; Poughkeepsie-Hyde Park, S.H. 453. Project F-322(15)	1.93	Asphalt Concrete	$6,000 Plans $10	105,000
Rockland (Rte. 59)	RC 57-113	Nyack Village: Main Street, S.H. 8459	0.06	Asphalt Concrete	$1,000 Plans $10	29,000
Ulster (Rte. 212)	RC 57-114	Willow-Mount Pleasant S.H. 1882	0.10	Slope Protection	$1,000 Plans $10	28,000
Westchester (Rte. 9)	FARC 57-115	Broadway-Irvington Village, S.H. 8456 Project F-682(7)	1.86	Asphalt Concrete	$5,300 Plans $10	94,000
Westchester (Rte. 9)	FARC 57-116	Broadway-North Tarrytown Village, S.H. 8457 Project F-682(6)	1.46	Asphalt Concrete	$4,000 Plans $10	75,000
Westchester (Rte. 100)	FARC 57-117	Yonkers-White Plains, S.H. 5231 Project F-243(3)	2.36	Asphalt Concrete	$8,000 Plans $10	154,000
Westchester (Rte. 22)	FARC 57-118	White Plains-Armonk, Pts. 1 and 2, S.H. 20 and S.H. 35 Project F-418(4)	2.84	Asphalt Concrete	$8,000 Plans $10	148,000
DISTRICT No. 9, J. C. Frederick, District Engineer, 71 Frederick Street, Binghamton, N. Y.						
Broome (Rte. 11)	FARC 57-119	Castle Creek-Whitney Point, S.H. 1450-A Project F-717(4)	3.66	Asphalt Concrete	$19,000 Plans $10	350,000
Broome (Rte. 17)	FARC 57-120	Binghamton-Windsor, Pt. 4, S.H. 5241; Windsor-Deposit, S.H. 5338. Project F-344(22)	4.27	Asphalt Concrete	$22,000 Plans $10	388,000
DISTRICT No. 10, M. E. Goul, District Engineer, 325 W. Main Street, Babylon, L. I., N. Y.						
Suffolk (Rte. 111)	RC 57-122	East Islip-Smithtown Branch, S.H. 1208	3.09	Asphalt Concrete	$10,000 Plans $10	180,000
Suffolk (Rte. 27)	RC 57-124	Center Moriches-Westhampton, S.H. 8039	0.57	Asphalt Concrete	$2,500 Plans $10	47,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage) Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds.

Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders".

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

The Advertisements in this section include all employment opportunities—executive, management, technical selling, office, skilled, manual, etc.

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Positions Wanted
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Selling Opportunities Wanted
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Employment Agencies
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Subject to Agency Commission.

$2.10 per line, minimum 3 lines. To figure payment count 5 average words as a line.
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Discount of 10% if full payment is made in advance for 4 consecutive insertions.
Not subject to Agency Commission.

Send NEW ADS or inquiries to Classified Adv Div of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36, N. Y. July 25th Issue Closes July 15th

CONSTRUCTION SUPT.

About 40—Experienced in water, gas, electric and telephone construction—A small contracting company needs man to handle expanding forces in New Jersey and New York. Kindly reply to:

P-5328, Engineering News-Record,
Class. Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

HIGHWAY ENGINEERS

DESIGNERS, DRAFTSMEN, SURVEYORS

Excellent opportunities for experienced men having ability to produce professional work on schedule. Employee benefits. Salaries commensurate with qualifications. Please send detailed educational and experience resume plus availability.

ROBERT W. LOWRY, INC.
227 Pine St. Harrisburg, Pa.

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Gunite Superintendent—Wanted immediately. Middle Atlantic States. State age, experience, availability, salary desired. P-4640, Engineering News-Record.

Engineer-Gunite, wanted immediately, must know estimating, take complete charge of all gunite operations. Executive position ultimately available. P-5355, Engineering News-Record.

Highway and Bridge Engineers, Designers, Draftsmen. Permanent positions. Well established and growing. (Location Southern Connecticut). Send resume of experience to: P-4969, Engineering News-Record.

Engineering graduates with experience in testing and control of concrete, asphalt and soils for permanent position in New England. Give full details of experience and education. State salary requirements. P-5295, Engineering News-Record.

City Engineer—Street Superintendent, Arcata, Calif., (pop 4720) Calif. Registration Required. Municipal experience preferred but not mandatory. Salary open. Attractive, challenging position in college town, modern schools, equable climate, progressive community. Apply City Engineer, City Hall, Arcata, Calif. List qualifications.

Assistant City Engineer, Arcata, Calif., Graduate Civil Engineer. Apply City Engineer, City Hall, Arcata, Calif. List qualifications.

Wanted, experienced structural draftsman to supervise the work of six draftsmen, handle job correspondence, subcontracting of drawings, etc.; write stating qualifications and compensation desired. P-5393, Engineering News-Record.

Civil Engineer, recent graduate, for work with County Public Works Department. Work will include design of storm drainage systems, roads and streets, shore erosion control, culverts and small bridges. Fringe benefits. Salary commensurate with experience. Write Director of Public Works, Post Office Box 506, Annapolis, Maryland.

Opportunity: Building and Grounds Supervisor, growing Public School System, Long Island (40 miles from New York City). Act as resident engineer on new building projects; develop and supervise maintenance plan for all buildings and grounds including work up of specifications and purchasing of supplies and equipment. Engineering and/or architectural training plus experience in large plant construction and maintenance desirable. Retirement and other benefits. Now open. Permanent position for right man. State salary requirements. Replies should be addressed to: Dr. Charles T. Cowan, Superintendent of Schools, 235 Main Street, Northport, New York.

POSITIONS VACANT

Field Engineer—Position of Assistant Resident Engineer on large steam electric station construction open for Civil Engineer. Several years experience on similar work desirable. Location Midwest. Send resume of education, experience, with references and salary requirements. Pioneer Service & Engineering Co., 231 So. LaSalle St., Chicago 4, Ill.

Instructors for civil engineering department starting September 1, 1957; bachelor's degree preferred, so that specialization may fit instructor and departmental needs. Salary $4050 for nine months. Extra work for consultants permitted and encouraged. Graduate courses may be taken. Location, Mississippi. P-5495, Engineering News-Record.

Beginning Civil Engineer—Recent graduate. Mount Clemens, Michigan. Near Lake St. Clair. 20 miles Northeast of Detroit. Annual salary $5,122-$5,902. P-5509, Engineering News-Record.

Teaching—Increased enrollment requires new staff members as instructor to associate professor level to teach Structures, Fluid Mechanics, Mechanics and Strength of Materials. Opportunities to participate in contract research. Also opportunity for advanced degree for instructors. Head Civil Engineering Department, University of Tennessee, Knoxville, Tennessee.

Excellent opportunity in Consulting Engineer's office for competent engineer experienced in design and inspection of water and sewage systems, water and sewage treatment plants, estimates, reports. Sta[te] education, age, experience, salary requir[ed] and when could report. Correspondence [con]fidential, P-5461, Engineering News-Record.

Wanted—Experienced concrete paving superintendent for work in Kansas and surrounding area with Wichita, Kansas headquarters. Martin K. Eby Construction Co. Inc., P. O. Box 1679, Wichita, Kansas.

Two Teachers, Mechanics, Applied Electricity, General Physics. One Head of Department, Ph.D. engineering preferred. B.S. or M.S. also considered. Salary and rank dependent on qualifications. Salary scale good. Room for advancement. Apply President, Montana School of Mines, Butte, Montana.

Inspectors—Concrete, Soils & Asphalt, Lab & Field. For Overseas Airbase Construction. Temperate Climate. Please send detailed resume. P-5483, Engineering News-Record.

Inspectors; For Asphalt Paving on Turnpike Project in Eastern Connecticut. Salary Open. Greenhut & Taffel, P. O. Box 34, Jewett City, Conn.

Superintendent of Equipment Maintenance— for large fleet of dump trucks, trailers, and heavy equipment. Must be prepared to take immediate charge of 55 man maintenance operation, including general repairs, PM, tire shop, unit rebuilding and parts department. This is a lifetime job opportunity, not a construction set-up. Send job resume, including salaries earned and references. P-5513, Engineering News-Record.

POSITIONS VACANT

Field Engineer—Cement Company, Location —New Jersey Area. C E Graduate required. Age—25 to 35. Travel to adjoining states on alternate weeks. Remarkable opportunity with progressive company. P-5542, Engineering News-Record.

Architectural Engineer—with at least 8 to 10 years experience in steel and concrete. Permanent position—associateship possibilities with other if ability proven. Work includes churches, schools and commercial buildings. Air-conditioned offices. Hospitalization and other benefits. Central Pennsylvania architect. Please send resume of education and experience, stating salary requirements and availability, also snapshot and references. P-5527, Engineering News-Record.

POSITIONS WANTED

Construction or Project Manager, capable executive. 27 years experience from field superintendent to Foreign Resident Manager. All types multi-million dollar construction, foreign and domestic. Contract negotiations, estimating, purchasing, labor and public relations. Spanish, German, French Portuguese. Seeking a permanent assignment but would consider challenging term contract in Europe, Latin-America or USA. PW-5275, Engineering News-Record.

B.C.E. 1951. Experience on highway and airport construction. Seek position with general contractor or engineer. PW-5358, Engineering News-Record.

C. E. Draftsman, 8 yrs. exp. designing-detailing Sewage Treatment Plants, Pumping Stations, Sewer Supervision. Married, interested in relocating with consulting engineer. References. PW-5484, Engineering News-Record.

C. E., 7 yrs. heavy and building construction experience. Field and office engineering. Estimating experience, handle bids, architects, all trades. Construction in permanent location or Plant Engineering. PW-5457, Engineering News-Record.

Sewer foreman, middle age, Italian, experienced, able, attentive and honest; would like to join a conscientious sewer contractor for permanent position with the guaranty of satisfactory results in installing well point system, shoring, tunneling, rock blasting and any other phase of sewer work that required ability and experience. Will consider small job as well as large project. PW-5498, Engineering News-Record.

Pre-stressed concrete specialist: Reg. P. E., age 37, 8 years experience in all phases of pre-stressing industry, now general manager of major producer of structural products, wants new position. Prefer far Southwest, Pacific Northwest, or Alaska. Available Dec. 1, 1957. PW-5530, Engineering News-Record.

Heavy Construction Business & Office Manager, seeking position with growing concern. Experienced in all types of office work; public relations; Banking & Bonding Co. connections. Complete resume upon request. PW-5516, Engineering News-Record.

Chief Draftsman—Experienced with structural fabricating companies, considering change as Chief Engineer or Chief Draftsman with reliable Co. PW-5419, Engineering News-Record.

Coordinator Service Parts. Six years with major U. S. oil company. Recently returned from overseas assignment. Administered all parts functions applicable to automotive, marine, construction, oil drilling and shop equipment. Encompassed 15 million dollar program. Liaison with zone of operations, manufacturers, U. S. and Europe. Coordinated standardization, non-dollar procurement storehouse operations and procedures applying to multi-million dollar inventory. Resume on request. PW-5511, Engineering News-Record.

C. E. age 34. Structural and Sanitary. Five years design and field inspection experience, with small consulting office. Seek responsible position which includes meeting and working with people. Would consider Industrial, Consulting or Contracting firms. Location, New York State. Reg. N.Y.P.E. PW-5543, Engineering News-Record.

Building Construction Superintendent: Industrial, Commercial, Institutional, Etc;—Desires position as field supt; not an estimator. Over 25 years experience. Age 55; Prefer Eastern States. Can travel with reliable contractor. PW-5535, Engineering News-Record.

BRIDGE & HIGHWAY ENGINEERS

DESIGNERS DRAFTSMEN

Positions open for qualified men in highway structures and related work. Extensive program. Excellent working conditions and many employee benefits.

Mail complete resume to:

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153 E. Elizabeth St.
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ASSISTANT TRAFFIC ENGINEER

For Traffic Engineering Department recently established. Salary range $622 to $691 a month with maximum salary obtainable through annual and longevity increases. Registration as a professional engineer required. No residence restrictions for U. S. citizens to begin work. Wisconsin Retirement Fund and Social Security Benefits.

PERSONNEL DEPARTMENT
404 City-County Bldg., Madison 9, Wis.

Wanted:

STRUCTURAL ENGINEER

Prestressed Concrete Field

We are continuously expanding our operations in the concrete products industry, because of our faith in the future of Mississippi.

We are seeking the services of a qualified structural engineer to work in our prestressed concrete division.

This is a new and fascinating field in its embryo stages in this country.

Contact us for an interview.

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P. O. Drawer 1292—Tel. 3-1677
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ASSISTANT CHIEF ENGINEER

C.E. experienced in structural steel detailing and design, checking and estimating to understudy for Chief Engineer with long established structural steel fabricator. Submit detailed resume and photograph.

C. E. MORRIS COMPANY
745 Curtis Avenue Columbus, Ohio

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There's Opportunity on Beautiful Gulf Coast

Immediate openings for:

CHIEF STRUCTURAL ENGINEER
New Orleans office—experienced in highway bridge design.

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STRUCTURAL ENGINEERS
DRAINAGE ENGINEERS
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DRAFTSMEN—HIGHWAY AND STRUCTURAL
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Company paid hospitalization, life insurance and retirement. 40-hour week. Air-conditioned offices. Liberal salaries. Permanent position. Excellent opportunities for advancement. Send complete resume of education and experience with salary requirement to:

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College graduates 0-3 years experience.

College graduates with three to five years experience in bridge design.

Positions available in the bridge design section which has long term contracts and is expanding to meet demands for consulting engineering services for bridge projects.

Opportunity to gain experience and to practice engineering under outstanding bridge engineer who has 25 years of practical experience. Chief of Section was also at one time professor at large university and is author of several structural design text books used in over 90 engineering schools. With the teaching and writing background he fully appreciates the necessity and obligation of training young engineers.

Information required—Submit resume giving personal, education, and experience information. Provide references. State when you would be available for interview.

PATCHEN & ZIMMERMAN ENGINEERS
525 TELFAIR STREET
AUGUSTA, GEORGIA

STRUCTURAL ENGINEERS DESIGNERS DRAFTSMEN

Prefer several years or more experience in any of these fields:

BRIDGES

BUILDINGS
EXPRESSWAYS
HYDRO PROJECTS
TEST FACILITIES*

Will consider lesser experience with good educational background, including several recent graduates to round out a planned expansion program. Occasional openings for combination field men. These are permanent additions to our regular staffs.

We are professional engineers engaged primarily in design which covers a wide scope of practice. The variety and unusual character for example, the proposed world's largest bridge project—offer excellent opportunity for professional development and advancement.

Immediate openings in our St. Louis general offices and occasionally in our San Francisco branch office. Confidential interviews can also be obtained at Washington, D.C., and Portland, Oregon.

Paid vacation, sick leave, holiday, overtime. Excellent Employee Benefits Plan provides retirement income plus life and disability insurance. Blue Cross. Moving allowance.

Please write fully, including salary data, to

SVERDRUP & PARCEL, Inc.
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*We are designers of the technical facilities for the Arnold Engineering Development Center, operated by our subsidiary, ARO, Inc.

ENGINEERS

Long established firm of consulting engineers with world-wide practice needs both beginners and experienced civil, electrical, mechanical and foundation engineers for interesting work on large dams, powerplants, and river control works. Permanent positions. Liberal employee benefits. Starting salaries dependent on qualifications. Please send complete resume to Hugo Niemi, Personnel Manager.

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400 W. Madison St. Chicago 6, Ill.

Highway & Bridge Engineers Designers & Draftsmen

Career opportunities for men interested in professional recognition.
Excellent working conditions and employee benefits including liberal retirement program.
Openings in Pennsylvania, Maryland, Florida, West Virginia, Mississippi and overseas.

Air Mail Resume TO R. L. SHAW, Personnel Director

MICHAEL BAKER, Jr., INC.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

DEPUTY RESIDENT ENGINEER

For a $40 million rockfill and concrete dam in Iraq. Two-year contract; approximately 3-year completion schedule. Family housing at site, but no local educational facilities for children. Fill type dam construction experience required—preferably rockfill. Must be fully capable of assuming duties of Resident Engineer as required. Position is available immediately. Excellent salary. Please send complete personal and experience record to Hugo O. Niemi, Personnel Manager.

HARZA ENGINEERING CO.
400 W. Madison St. Chicago 6, Ill.

HIGHWAY & BRIDGE ENGINEERS

Several Openings For Designers, Draftsmen and Detailers

MATERIALS ENGINEER

Mature Man With Minimum of 10 Years Experience in Concrete & Materials

CONCRETE INSPECTORS

Experienced in Batching, Mixing, Placing, Prestressing and Other Phases of Concrete Inspection. Positions Available in Illinois.

Generous Annual and Sick Leave, Hospitalization, Group Insurance, Profit Sharing.

PLEASE WRITE OR CONTACT

JOSEPH K. KNOERLE & ASSOCIATES, INC.
155 N. WACKER DRIVE CHICAGO 6, ILLINOIS

CHIEF ENGINEER—HIGHWAYS

FOREIGN POSITION

American Chief Engineer qualified to direct and expand existing highway organization required in Near East Country. Extensive highway development program involved. Unusual long term opportunity. Submit detailed personal history and experience record. Initial inquiries will be treated confidentially.

P-5523 Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N. Y.

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ATTRACTIVE POSITIONS ARE AVAILABLE FOR QUALIFIED MEN WHO WILL ACCEPT RESPONSIBILITY AND WISH TO MAKE A CAREER IN DESIGN OF HIGHWAYS, EXPRESSWAYS AND ALLIED CIVIL ENGINEERING WORK. THERE IS AMPLE OPPORTUNITY FOR PROFESSIONAL ADVANCEMENT BASED UPON MERIT. SALARIES ARE REVIEWED AT REGULAR INTERVALS. PAID VACATIONS, SICK LEAVE AND MOVING ALLOWANCE. EXCELLENT RETIREMENT AND BENEFIT AND HOSPITALIZATION PLANS.

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Dirt . . . Paving . . . Bridges . . .

Long Established, Reputable New York State Thruway Contractor wants the best man available for project construction superintendent. Applicant must present complete record of past experience. Record must prove ability to assume full responsibilities for all types earth moving, concrete and asphalt paving, structures and heavy equipment. Work area principally but not confined to New York and adjacent states. Travel is required. Salary, future, etc., excellent for right man. Interviews granted only after study of record and references. Company requirement is high quality work performed profitably. What are your requirements.

P-5351, Engineering News-Record,
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CIVIL

Experienced in site development, storm drainage or water supply.

HYDRO

Recent work experience on concrete or earth dams; power houses or penstocks.

Liberal relocation allowances for you and your family.

Send Resume to:
Manager of Employment & Placement
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Bechtel Corporation
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Degree or equivalent. Strong background AE work including field design & supervision, inspection & construction. All phases Civil & Structural on airbases or similar projects.

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Degree or equivalent. Strong background AE work including field design & supervision, inspection mechanical and POL installation, air base or similar.

CHIEF INSPECTORS & SR INSPECTORS

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Heavy experience AE inspection or supervision. Degree or equivalent.

TECHNICIAN—ASST

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Familiar Asphalt, Concrete & Soils testing. Assist in Lab & Field.

. . . Excellent base pay
. . . Guaranteed overtime
. . . Room & Board furnished

Send complete resume including past employment, salaries and references to

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GENERAL SUPERINTENDENT for WRECKING PROJECTS

Experienced man to plan, direct, and supervise multi-story wrecking projects in New York City area. Prefer man who has previously superintended large demolition jobs, but will consider construction superintendent with major project experience. Year round position with a future. Direct letter outlining your experience, age, earning record, and other pertinent data to M. K. Wolfson, Vice President.

CLEVELAND WRECKING CO.
826 Seventh Ave. New York 19, New York

DISTRIBUTORS AND SALESMEN WANTED

We manufacture a world famous concrete additive which gives increased strength, workability and numerous other advantages to concrete.

Territories are available for men who must have concrete experience and contacts with Ready-Mix-Operations.

Liberal discounts and exclusives to men with proper qualifications.

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SW-5521 Engineering News-Record
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Send post card for details.

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CONSTRUCTION CONSULTANTS
P.O. Box 921 Lake Worth, Florida

REPLIES (Box No.): Address to office nearest you c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

SPECIAL SERVICE

Specification Writing Service for Arch-Engrs. Fed, City, Private, N. Y. Area, Schools, Hyway, Bridges, Bldgs, Utilities, Mod. Fee. SS-5335, Engineering News-Record.

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Structural Engineering Firm, extensive experience in design of highway and railroad bridges, presently available, reputable, licensed. CWW-5510, Engineering News-Record.

STRUCTURAL ENGINEERING
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OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations . . . Forty third year
WILSON *Engineering Corp.*
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WANTED

5 YARD ELECTRIC SHOVEL—Must be in perfect working condition and not too old.

NEW YORK TRAP ROCK CORPORATION
230 Park Avenue New York 17, New York

WANTED

Used Tug approximately 700 Horsepower, between 60' to 80' in length. Advise details, cost and location. Contact: R. C. HUTCHINSON

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MANITOWOC LIFTCRANE
MODEL 3000B AND 3500
FORSYTHE EQUIPMENT CO., INC.
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Two (200) pcs. H BEAMS (BP)
57 lbs., 45 to 65 ft. long
Location: Baltimore, Md.

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Tel. Idlewood 5-8053

FOR SALE

PORTABLE,—SECTIONAL—STEEL BARGE, (60' x 22' x 5')—Self-Propelled, if desired. Barge can be dismantled into sections 7 ft. wide x 30 ft. long, or smaller, for over-the-road shipment, to and from jobs. Can be assembled into any width desired—7'—14'—22'—etc. Ideal for Cranes up to 1½ Yd. Cap. or Dredge, Causeway, Dock, or Pier. Landing ramp on one end for ground loading of heavy equipment. Cost new—approx.—$35,000. Our Selling Price—$7500. Also Available—to propel this barge—OUTBOARD ENGINE—with steering wheel, mfd. by Murray & Tregurtha, with a 225-hp GMC-671. Tail can be elevated in and out of water for shallow water operation. Cost new—approx.—$15,000. Our Selling price—$7500.—Contact—

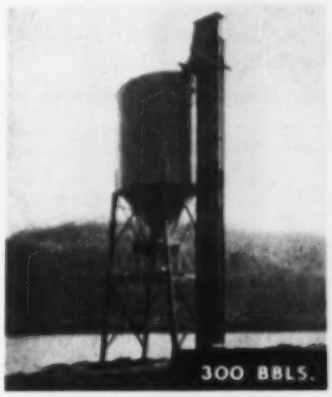
PUBLIC SALES, INC.—214 56th St.,
Virginia Beach, Va. Tel. 3171-M

LOW COST INSTALLATION AND OPERATION
CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 3 to 20 TONS
SELL, RENT or BUY
FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS
FOR SPEED ECONOMY EFFICIENCY FLOOD SAFETY LABOR REDUCTION
AMBURSEN DAM CO INC.
295 MADISON AVE NEW YORK

GRAVEL PLANT

Single Unit portable Universal Gravel Plant consisting of 1024 Jaw Crusher, 14" twin roll crusher, 3 x 10 3½ deck screen, necessary conveyors, etc., all on running gear powered by GMC diesel engine. Excellent condition. F.O.B. Buffalo, New York $25,000.

SYRACUSE SUPPLY COMPANY
SYRACUSE, N. Y. Phone GRanite 8-3157



Four (4) new, unused, Blaw-Knox cement batcher, BCPC-300 hi-bin with elevator, 13' 6", scales, screw, complete with gasoline power unit. Still in original crates with spare parts. Shipped new 1954, warehouse stored. Call, write or wire

TESTA BROS., INC.
P. O. Box 36
Richmond Road Bedford, Ohio
Phone BEdford 2-5151

Slightly Used
80D Northwest Double Stick Shovel Attachment
Excellent Condition

HODGE & HAMMOND, INC.
720 Garrison Ave., New York 59, N. Y.
Phone—Kilpatrick 2-2400

FOR SALE

3 Allis Chalmers T.S. 200 13 yd. Motor Scrapers. New—1955.
3 Allis Chalmers T.S. 200 13 yd. Motor Scrapers. New—1956.
3 Allis Chalmers Model 360 18 yd. motor Scrapers. New—1956.
3 H.D. 21 Allis Chalmers Bulldozers. New—1956.
1 Allis Chalmers H.D. 16 Bulldozer. New—1956.

These machines priced for quick sale, and are in the Binghamton, N. Y. area. Phone SERAFINI CONSTRUCTION CO., INC. at Binghamton 4-2385.

KOEHRING CRANE AND SHOVEL ATTACHMENTS

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Allgemeine Elektricitats 15
Allied Steel & Conveyors Div. Sparton Corp. 125
American Bridge Div., U. S. Steel Corp..... 127
American Steel & Wire Div. U.S. Steel Corp. 139
Armstrong Cork Co..... 147
Armco Drainage & Metal Products, Inc....70, 71
Austin Western Co..... 109

Bay City Shovels, Inc..... 72
Belmont Iron Works..... 126
Bendix Aviation Corp.....44, 45
Bethlehem Steel Co..... 105
Bower Roller Bearing Co..... 69
Bruning Co., Inc., Charles..... 121
Bucyrus-Erie Co. 31
Butler Mfg. Co..... 126
Byers Co., A. M..... 113

Caterpillar Tractor Co.....76, 77
Chase Brass & Copper Co., Inc..... 17
Clipper Mfg. Co..... 130
Clow & Sons, James B..... 90
Clyde Iron Works, Inc..... 117
Colorado Fuel & Iron Corp..... 99
Concrete Grinding Corp..... 118
Concrete Reinforcing Steel.....94, 124
Copperweld Steel Co..... 90

Dodge, F. W..... 89
Dorr Oliver, Inc..... 88
Dravo Corp. 98
Dudgeon, Inc., Richard..... 98

Earle Gear & Machine Co..... 97
Eastman Kodak Co..... 85
Enjay Co., Inc..... 135
Euclid Div. G.M.C..... 9

Fennel Instrument Corp. of America..... 87
Firestone Tire & Rubber Co..... 100
Michael Flynn Mfg. Co.....36, 37

Garrett Corp. 95
Goodall Rubber Co..... 133
Goodyear Tire & Rubber Co..... 7
Greenlee Tool Co..... 131
Griffin Wellpoint Corp..... 126
Gunite Concrete & Const..... 112

Hardin, E. L. Assoc., Inc..... 14
Hazard Wire Rope Div., Amer. Chain & Cable 6
Homelite Div. Texton American, Inc....102, 103
Horn Co., Inc., A. C. Div. Of Sun Chemical. 143
Hose-McCann Telephone Co., Inc..... 88

Imperial Pencil Tracing Cloth..... 98
Ingersoll Rand Co..... 11
Irving Subway Grating Co..... 68
Irvington Form & Tank Corp..... 120

Jaegar Machine Co..... 16
Jersey Bolt & Spike..... 112
C. S. Johnson..... 66
Jones & Laughlin Steel Corp..... 141
Joy Mfg. Co..... 91

Kern Instrument Co..... 116
Koppers Co., Inc..... 8

Layne & Bowler, Pump Co..... 73
Lead Industries Assoc..... 114
LeRoi Div. of Westinghouse Airbrake Co.... 123
R. G. LeTourneau Inc.....56-61
Lone Star Cement Corp..... 22

Madesco Tackle Block Co..... 112
Mahon Co., R. C..... 62
Manitowoc Shipbuilding, Inc..... 97
Master Builders Co.....3rd Cover
McKiernan-Terry Corp. 46
Midland Prod. 116
Moretrench Corp.....12, 13
Mueller Co. 86
Murphy Diesel 1

Neenah Foundry Co..... 122
Nelson Stud Welding Div. Gregory Ind. Inc. 43
Newport News Shipbuilding & Drydock Co.. 54
Northwest Engineering Co..... 3

Patent Scaffolding Co..... 96
Pennsylvania Drilling Co..... 98
Phoenix Bridge Co..... 112
Portland Cement Assn..... 144
Frederick Post Co..... 42

Ramset Fasteners, Inc..... 34
Raymond Concrete Pile Co.....52, 53
Reynolds Metal Co., Inc..... 128
Roebling's Sons Corp., John A..... 119
Ryerson & Sons, Inc., Jos. T..... 18

Servicised Products Co..... 10
Shell Oil Co.....92, 93
Smith Co., S. Morgan..... 49
Smith Engineering Works..... 20
Southwest Steel Prod. Div. Armco Steel Corp. 33
Spencer, White & Prentis, Inc..... 29
Standard Dry Wall Products..... 74
Rockwell Spring & Axle Co., Div. Standard Steel Spring 94
Standard Steel Corp.....2nd Cover
Steelcraft Mfg. Co..... 30
Steel Joist Institute..... 67
Symons Clamp & Mfg. Co..... 2

Texas Co. 4, 5
Thew Shovel Co..... 40
Timken Roller Bearing Co.....4th Cover

Union Oil Co..... 75
Union Wire Rope Corp.....110, 111
U. S. Steel Corp.....106, 107
Universal Form Clamp Co..... 35

Vascaloy-Ramet Corp. 101
Viber Co. 82

Water Seals, Inc..... 115
Waukesha Motor Co..... 84
Westinghouse Electric Corp.....80, 81
Williams Equipment & Supply Co..... 90

Professional Services 158

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

Employment Opportunities....152-154
Educational 155
Notices
Proposal 149-151
Equipment
(Used or Surplus New)
For Rent, Sales Wanted....155-158

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Who Gets the Water?

FAILURE OF THE CALIFORNIA LEGISLATURE to implement extensive statewide water plans was a serious blow not only to the state program there but to water planners everywhere who have looked to California for a demonstration of large-scale, non-federal efforts in the water resource field. Locally, it was viewed by many as an example of unwillingness to compromise by those Southern Californians who fear they might not get a fair share of the water to be developed. Viewed nationally, it appears simply that California found it could not launch into water resource development without some agreement on its intrastate water rights questions.

Engineers of California's State Water Department have been intent on "keeping the project moving while the people are wrestling with policy questions." But the people, as represented by the legislature, not only fell down on policy determination, but in addition came within hairbreadth of denying the department enough money to keep itself alive.

The root of the trouble is that Southern California legislators, with strong backing of water agencies from that part of the state, insist that no appreciable sums be spent until guarantees are established that definite and substantial amounts of water be delivered to the south. And they had the voting power to be unyielding in their position.

Admittedly, the water rights question in California is a sticky one: The water is in the north, and the population growth is in the south. But there seems to be no reason why it cannot be settled amicably. Studies indicate that regardless of the future needs in the northern part of the state there will be ample supplies available to meet justifiable economic needs of the south when coupled with presently exploited supplies.

Most certainly the state legislature was working under extremely trying conditions: a strict deadline to be faced, important national political implications involved and major decisions to be made. Even so, compromises might have been reached, or tentative decisions could have been made that would have kept the works moving swiftly ahead.

Southern California is a fast-growing area, one that could become, in not too many years, the most populated area in the U. S. But such growth will depend on large new water supplies, needed in a decade or so—sooner than desalted seawater or reclaimed waste water will be available even if nuclear power could help.

Southern California, it would seem, can meet its apparent destiny only through settling its water future, and it tried to settle that future now, and with complete definiteness, by establishing its water rights in this legislative session. However, its apparent unwillingness to budge from an extreme demand for guarantees has resulted in no settlement at all—an unwelcome condition in which to leave such a pressing problem. Even if complete settlement were not possible in this session, an interim agreement on the rights question should have been reached so that engineers of the state might achieve their aim of "keeping the project moving."

Palm Greasing

THE PRACTICE of giving tips or gratuities to get service to which one should be entitled anyway, while always objectionable, may not be too serious when the recipient is a taxi driver or a waiter. It takes on a quite different aspect, however, when a government employee is on the receiving end, and the giver is an architect, an engineer or a contractor.

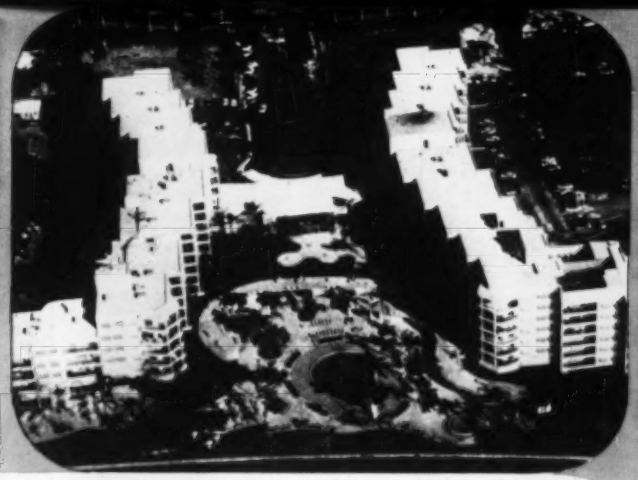
Such palm greasing is petty graft, pure and simple, and is thoroughly reprehensible. Not only is it morally indefensible, it increases the cost of construction.

These remarks are engendered by what New York City newspapers refer to as an "exposé" of bribe taking by inspectors in that city's building department. In large degree, however, the newspapers are merely making headlines out of a recurring, if not chronic, situation, which the city officials seem to admit by their reaction to the charges. Thus, neither the mayor nor the acting building commissioner categorically deny the existence of the malodorous condition, the mayor replying to the charges by merely stating that "if the evidence is there, we will prosecute to the fullest."

But there is no reason to criticize the mayor of New York anymore than the mayor of any other city. So called "honest" graft—and an adjective more badly cast is hard to imagine—is a common disease. One of the construction industry's most universal complaints is of payments made to government employees for services that should be freely given as a part of their duties.

Unfortunately, these complaints seldom will be voiced in public. If the architect, engineer or contractor has been coerced into making a payment, he will hesitate to make an issue of it for fear of retaliation. If he has originated the idea of giving a gratuity in order to gain a competitive advantage—and sadly this has occurred—he is, of course, not interested in publicity.

To end palm greasing may be impossible, but it could be reduced substantially by government and construction industry cooperation. On their part, city officials could keep continual pressure on their employees by meting out quick punishment for dishonest acts. And the construction industry could set up special committees in its professional societies and contractor organizations, which would take complaints from individuals and pass them along to city officials. Some such united stand is necessary if palm greasing is to be reduced. It would be a worthwhile project for the construction industry to undertake.



Palm Beach Towers Hotel, Palm Beach, Fla.; Arch.—John Hans Graham & Assocs., Washington, D. C.; Struc. Engr.—Obeler & Clarke, Miami; Consltg. Engr.—Norman C. Schmid & Assocs. Palm Beach; G. C.—Taylor Construction Co., Miami; Pozzolith Ready-Mixed concrete—Burnup & Sims, and Rinker Materials, West Palm Beach.

Thunderbird Motel, Miami Beach, Fla.; Archt.—Norman Giller & Assocs., Miami Beach; Contr.— Taylor Construction Co., Miami; Engr. —Jules Channing, Miami; Pozzolith Ready-Mixed concrete—Maule Industries, Inc. & Acme Concrete Corp.

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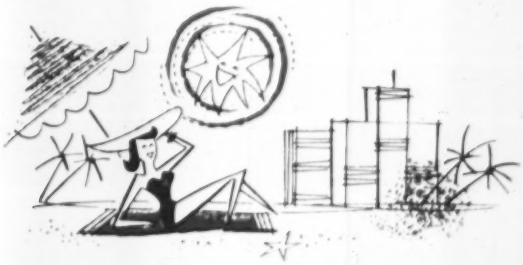

Americana Hotel, Bal Harbor, Miami Beach, Fla.; Archt.—Morris Lapidus, Miami Beach; Engr.—Obeler & Clarke, Miami Beach; G. C. —Taylor Construction Co., Miami; Pozzolith Ready-Mixed concrete —Maule Industries, Inc.

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